

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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EDITORIAL COMMENT.

Co-operation between Aeronautical Research and the Industry.

In a paper, entitled "The Rational Design of Aeroplanes," abstracts from which we publish elsewhere in this issue, Mr. A. R. Low calls special attention to the importance of greater co-operation between engineers engaged in research and those employed in the design of aeroplanes—in fact, his paper may be regarded as a justification for his plea. With this we are in complete agreement. Aerodynamical science is now progressing very rapidly, and problems are daily arising to confront the aeroplane constructor that research could readily assist in solving; and failing which, they must rely to a large extent upon trial and error methods—which are always expensive—and be guided by the dictates of past experience—that may or may not have been sound—in nearly similar circumstances.

At the N.P.L., and at the R.S.F., we have a considerable amount of valuable research being conducted, but unfortunately the results obtained are not available until months after the conclusion of the experiments, when their value has become considerably reduced, if they have not become, in some measure, of academic interest only.

Of this we have an excellent example at the present moment, as the Annual Report of the Advisory Committee for Aeronautics for 1912-13 has not yet been published! It was suggested in the course of a discussion on a paper read before the Aeronautical Society last year, that a monthly report might be issued; and that if there was any objection to the dissemination of this information broadcast at such early periods, a certain number of firms could be made acquainted with the results of experimental work. We do not, however, believe that there can be any valid reason why more frequent reports should not be made public—certainly not if the tests to which they refer have been concluded; and as regards the assistance thus given to other firms engaged in the aeronautical industry in foreign countries, it is common knowledge that progress in any branch of science has never been accelerated but rather retarded by secretiveness. An open exchange of thought and information is the only sure way in which the industry can be ultimately benefited. But even though these reports are published at more frequent intervals, there still remains the fact that the matter dealt with does not constitute one-tenth of the research which it is possible and desirable to inaugurate, and there are many problems that occur to the private constructor concerning which he requires immediate information.

For these reasons we welcome the suggestion of the Chairman (Mr. Mervyn O'Gorman), that aeronautical constructors should instal experimental wind tunnels at their works in the same way that manufacturers in other branches of engineering science have organised a research department. These tunnels are not expensive to construct, and the equipment required depends largely upon the extent and the nature of the investigations to be made. In any case, the information gained would more than compensate for any outlay involved, as the subject of the investigations, which would be largely formulated by the works' officials—the works' manager and designer—would be based upon past and present difficulties and future probable requirements. There is, however, one important fact to bear in mind—these tunnels will prove absolutely useless, or worse, unless those who have charge of the experiments are thoroughly grounded in aeronautical science, and skilled in the handling of instruments of a similar character. Good men, capable of undertaking this work, are to be obtained, provided that a sufficient salary is offered, but this may prove prohibitive with some firms who have not adequate resources to fall back

upon. And to all such we would make the suggestion that many engineers would be prepared to undertake the work, if they were at liberty to disclose the result of their investigations, at a salary which is well within the possibilities of any constructor in this country. Then we should have that co-operation between the theoretical and practical sides of aeronautical science which is so much to be desired.

Armoured Aeroplanes for the French Army.

Although we have to some extent become used to reading in the French journals that all is not well with military aviation in France—in fact, we have seen it seriously stated quite recently that, in French opinion, the premier place is occupied by Germany, with Great Britain second and France a bad third—the French army appears to be making a good deal of quiet progress. The latest piece of information according to *Le Matin* is that the Air Corps is now in possession of a squadron of armoured aeroplanes, each carrying a quick-firing gun, capable of throwing a shell weighing half-a-pound. These machines are of the monoplane type, and are two-seaters, having the vital parts protected by chrome-nickel steel armour, $2\frac{1}{2}$ millimetres thick, which is proof against rifle bullets at a range of 700 metres. They have engines developing 95 h.p. and a stated flying speed of about 62 m.p.h.

On paper, these seem to be exceedingly formidable machines and not to be matched in the air service of any other power. Their armour will enable them to fly with comparative safety at fairly low altitudes, which is good for purposes of observation. According to most authorities the unarmoured machine will have to maintain an altitude of over three thousand feet in order to be reasonably safe from modern rifle fire, while, with one reservation, the new French type ought to be able to fly safely over a hostile position at a height of possibly less than two thousand feet. The reservation of which we have spoken is that of the danger of the propeller being hit and disabled, and this seems to be the weak point from which all machines of the armoured type must inevitably suffer. The propeller is perhaps the most vulnerable part of any machine, and supposing it to be hit and disabled—and for it to be hit almost necessarily connotes its disablement—the armoured aircraft is in no better and no worse case than its unarmoured sister. At the same time, the chances of its being disabled from the cause noted, would appear to be much greater, since the pilot would certainly be tempted by his armour to fly lower and thus take the more chances.

On the other hand, there are, even at this early stage of the history of aerial war, several instances on record of pilots and observers being hit by hostile fire without disablement of the machine. During the Balkan campaigns, two instances of pilots being killed while flying were recorded. More recently in Morocco, a machine carrying two Spanish officers was hit repeatedly and both officers seriously wounded, again without anything happening to the machine itself. On balance, therefore, it would seem that provided the handicap of the lesser speed imposed by the extra weight of armour be not too great, the arguments so far as we know them at present are in favour of the armoured type. Probably the casualties that have happened to aviators in war would have been avoided had the machines been of the type which has now been adopted into the French army. It is as well, however, not to be too dogmatic on this point, because it is necessary to keep in mind in pronouncing this opinion that it has to be assumed that all other circumstances were equal. That is to say, sup-

posing these casualties were to have been avoided by the use of armour, the speed and altitude of the machines should have been as they actually were and not as might easily have been the case had the machines been armoured. It is, as we have already pointed out, a fair presumption to suppose that the pilots would have been flying lower and slower, relying on the armour for protection, than they actually were. Thus, the result in the end might easily have been the same. It simply comes down to this, that we shall really not know what are the comparative capabilities of the armoured and unarmoured aeroplane until they have been taught during the next great war. And that being so, we are not particularly curious to know. At the same time, it will be well that our own military authorities should keep closely in touch with what is being done in the direction under discussion.

Land for Aviation Stations.

As we write, an interesting case is being heard at the Surveyors' Institution, arising out of the desire of the War Office to acquire certain land at Orfordness, on the Suffolk coast, for an aviation station. The case is an ordinary one of arbitration regarding the price to be paid for the land, but the interest of it seems to lie in the progress of aviation which it connotes. Particularly significant was the evidence of Mr. Grahame-White, who expressed an abiding faith in the future of aviation as a commercial proposition—in fact, he went so far as to say that he looked to the new science to revolutionise the transport services of the world. He may have been, as some would think, unduly optimistic, though we are very much inclined to subscribe to his opinion, but at least he was prepared to back his opinions, and said that he would very much like to have an option on the land in question. That is one side of the interest.

The next point of interest that emerges is that the Government appears to be alive to the situation and is bent on acquiring land to serve for military stations at the most suitable points to meet the menace from across the North Sea. We have no desire to mix in matters of high politics, but as thinking citizens it is impossible for us to ignore the fact that the main danger, so far as we are able to foresee at the moment, is from the quarter indicated. That realisation, supposing it to be equally present in the minds of those responsible for our defence, must necessarily mean the strengthening of points nearest to the zone of danger. It is this realisation which has doubtless prompted the War Office in its selection of the particular site in question and the decision to acquire it must meet with the approval of all who have the cause of aerial defence at heart.

Aircraft in the Mexican War.

According to the *Times* correspondent with the American fleet, "two hydroplanes from the battleship "Mississippi" are scouting round Vera Cruz." Just in this commonplace way is information conveyed which, but a very few years ago, would have been given columns of descriptive writing as one of the greatest marvels of science—the last and greatest wonder of the world. There is nothing much to be said about it, either, for we have, truth to tell, become somewhat tired of pointing the moral of progress so often. It really seems sometimes that all the romance, all the wonder has dropped right out of aviation, when we find it treated in the matter-of-fact words employed in the chronicling of events nowadays. Even so, there is a wonderful object-lesson in it all, which the reader can easily discern for himself, without any prompting on our part.

MAY 2, 1914.

FLIGHT

MEN OF MOMENT IN THE WORLD OF FLIGHT



MR. J. ALCOCK, who has recently been flying the 100 h.p. Sunbeam-engined Maurice Farman so splendidly at Brooklands. Trained as an engineer, he joined Mr. Maurice Ducrocq, and was his chief mechanic for 2½ years. In Nov., 1912, he took his ticket on Mr. Ducrocq's Farman, on which he won several competitions in 1913. For a short time last year he was instructor at the Avro School at Shoreham,

FLYING AT HENDON.

LAST week has been both an historic and a sad one for Hendon. On Thursday a world's record was put up by F. W. Goodden, who, for the first time, looped the loop in the dark, whilst on Sunday one of the Aerodrome's most promising pilots, Philippe Marty, met with an accident which cost him his life. Thursday was the occasion of the first night-flying demonstration of the season, as well as the usual afternoon show of exhibition and passenger flights. The afternoon was fine, with a 30 m.p.h. N.W. wind blowing, and at 3.30 p.m. J. L. Hall came out on his 50 h.p. Avro biplane, after which Louis Noel pluckily made his first flight since his smash the previous Thursday, ascending on the 60 h.p. Morane-Saulnier, which he had never flown before. Shortly after, J. M. Cripps went up on the 50 h.p. G.-W. 'bus No. 109. Later on, L. A. Strange went up on the same machine, and Hall and Noel gave an exhibition on the Avro and Morane-Saulnier respectively. The 100 h.p. Anzani-Handley Page biplane then made its first appearance after a long period of confinement for alterations. Piloted by E. R. Whitehouse, it made a very pretty flight, banking over in fine style. After his first flight alone Whitehouse made several passenger flights, about four in all. Strange then took up a passenger on the 'bus, and F. W. Goodden ascended on the 60 h.p. Caudron and put up several loops. After this Marty went up on the Morane-Saulnier and executed five single loops and a couple of tail slides. One of the latter was rather peculiar, as when he pointed the nose of the machine upwards it remained in this position for some appreciable time, in fact, the machine seemed to climb some distance before the nose "flopped" earthwards in the usual manner. The rest of the evening was devoted to numerous flights by E. Baumann on the 40 h.p. Wright, Goodden on the Caudron and Whitehouse on the Handley Page. At 7.45 p.m. Strange and W. Birchenough went up in the twilight, the former on 'bus 109, and the latter on the bi-rudder 'bus which had just come out of hospital after a slight mishap the day before. By this time the aerodrome presented an extremely pretty appearance, as hundreds of fairy lamps of various colours which lined the different enclosures had been lit up, whilst the pylons were also illuminated. The first flight in the dark was made by Louis Noel on 'bus 109, which was decked with numerous small electric lamps. Noel remained up for five minutes, and immediately he landed Birchenough ascended on the bi-rudder 'bus, similarly illuminated, and also flew for five minutes—his first attempt at night flying. He had no sooner landed than Baumann went up on the Wright, and put up five minutes of very pretty figure flying; it was also Baumann's first experience of night flying.

The event of the evening, however, was Goodden's looping demonstration on the 60 h.p. Anzani-Caudron. It must be admitted that at first some anxiety was felt as to whether this plucky attempt would be successful, for it must be remembered that when flying in the dark it is almost impossible to ascertain what position the machine is flying by observing the earth, as the latter is as good as invisible. The question was, therefore, would Goodden be able to recover his normal flying position after completing the loop? The accumulators, employed for illuminating the machine, formed another problem, for it was not known if the machine would loop with the extra weight, although the difficulty of strapping in this electrical passenger was dealt with in an excellent manner. However, at five minutes past nine Goodden started off, and as soon as he was well clear of the ground he switched off his lights and continued to climb in total darkness, only switching on a single light above the nacelle now and again. When he reached a height of 2,000 ft. he switched on all the lights and executed his first loop. It was a pretty sight, the tiny lights on the machine looking not at all unlike a shower of meteors as they plunged earthwards. After his first loop he made two more at heights of about 1,000 and 1,500 ft., and then put up some fine banked spirals, finally descending after having been aloft for 25 mins., and making an excellent landing. He received a tremendous ovation and many congratulations. The final event was the bombarding and blowing up of the "battleship" anchored in the centre of the aerodrome, in which the two G.-W. 'buses took part assisted by numerous fireworks by J. Wells and Sons.

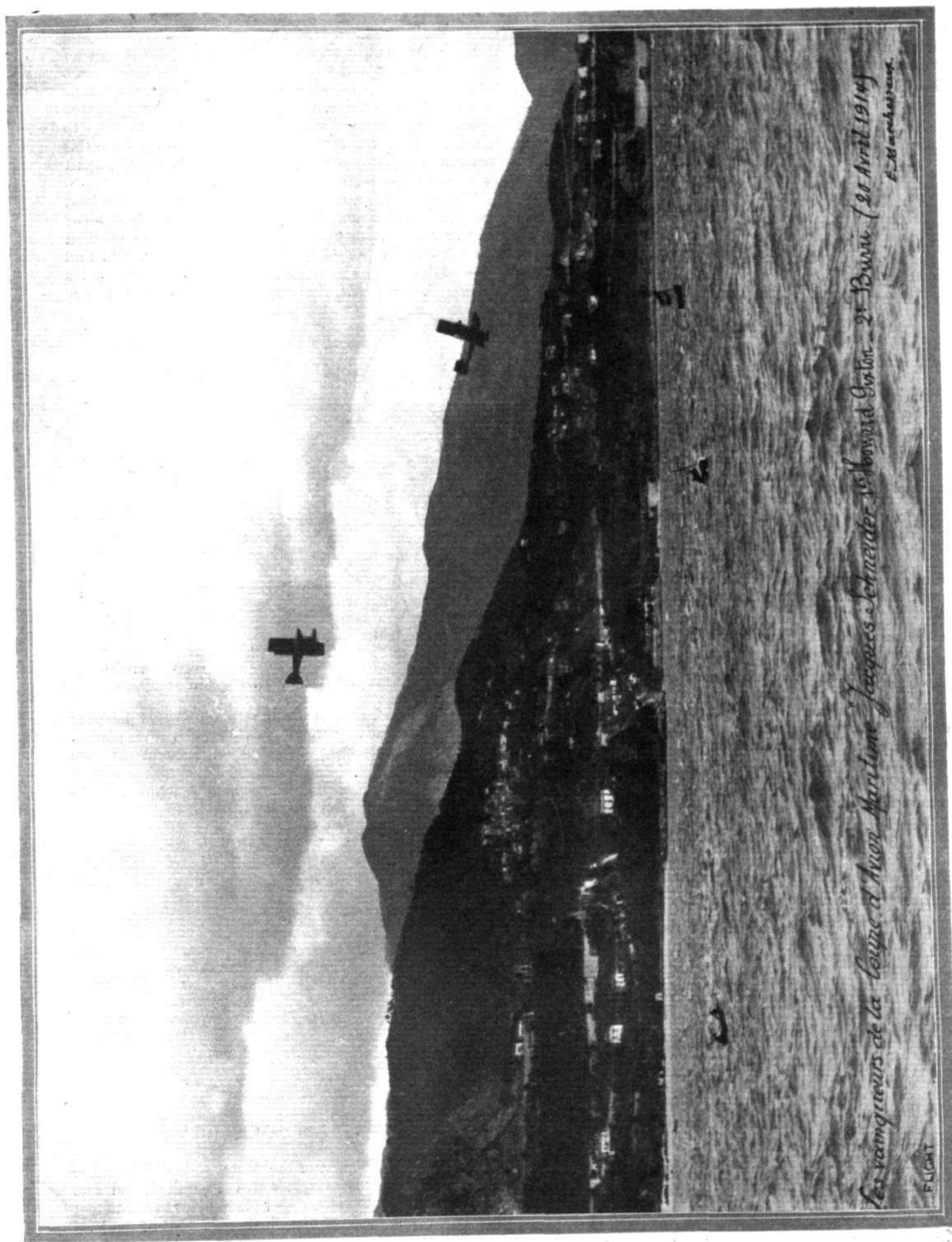
The fourth anniversary of the London-Manchester flight was celebrated on Saturday by the St. George's Meeting, the principal event being a 16-mile cross-country handicap. A strong easterly wind was blowing, but otherwise it was an ideal day, and many spectators turned up. The proceedings opened at 3.18 p.m. with a splendid "stunt" flight by Pierre Verrier on a new 80 h.p. Henry Farman biplane, Philippe Marty following shortly after on the 60 h.p. Morane-Saulnier. W. Birchenough came out next, and took up a passenger on the bi-rudder 'bus, whilst Verrier on the H. Farman, and J. L. Hall on his Avro also ascended. A little later on Marty went up on the Morane-Saulnier, and executed five loops, including two double ones, and three tail slides at heights

of about 1,000 ft. A start was then made for the cross-country race, but owing to the wind the distance was reduced to 12 miles, or three laps of the Bittacy Hill circuit. The limit man was W. Birchenough on the bi-rudder 'bus (9 mins. 10 secs.); Verrier on the 80 h.p. H. Farman starting second (1 min.), E. Baumann on the 100 h.p. Handley Page biplane third (33 secs.) and P. Marty on the 60 h.p. Morane-Saulnier was at scratch. The Handley Page biplane only made its appearance at the last moment, whilst the starter's flag was raised in fact, and had no sooner started when the engine gave out and Baumann only just managed to effect a proper landing inside the aerodrome; the others got away without incident. Marty obtained an easy victory, coming in first by 22 seconds, Birchenough being second, with Verrier 19 seconds behind. The times and handicaps are as follows:—

	Handicap.		Handicap	
	m.	s.	m.	s.
1. Philippe Marty (60 h.p. Morane-Saulnier monoplane)	scratch	21 51
2. W. Birchenough (50 h.p. G.-W. biplane)	9	10		22 13
3. P. Verrier (80 h.p. Henry Farman biplane)	1	0		22 32
E. Baumann (100 h.p. Handley Page biplane)	0 33	retired

After the race, further exhibition and passenger flights were put up by Verrier on the H. Farman, R. J. Lillywhite on the bi-rudder 'bus, and R. H. Carr made a test flight on the G.-W. five-seater aerobus (100 h.p. Green) with a mechanic, Lillywhite and M. Osipenko as passengers. This flight being satisfactory, Carr then took up another three passengers, whilst Strange ascended on the bi-rudder 'bus, and Marty put up another looping display, executing one single loop, one double loop, and a tail slide at heights varying from 1,000 to 800 ft. Carr made two more passenger flights on the five-seater, at one time taking up Mr. D. Thorburn and Mr. W. Barr (of Cellon). The remaining flights of the evening were made by Birchenough on the bi-rudder 'bus with passengers. The new 100 h.p. Gnome G.-W. "pusher" military biplane was brought out for an airing late in the evening and the engine tested—Claude Grahame-White and Carr narrowly escaping a nasty encounter with the four-bladed propeller through the engine starting unexpectedly. Early in the evening the megaphone man announced that Gustav Hamel had left Derby at 5.30 p.m. and might be expected any moment, but it was not until 7.35 p.m. that he suddenly appeared over the sheds at the west end of the aerodrome. He had with him as passenger the Baron de Gunsberg, and explained his late arrival as being due to the fact that he "dropped" into Lord Desborough's place at Taplow for tea. He also had to descend in a field at Bicester owing to a broken petrol pipe.

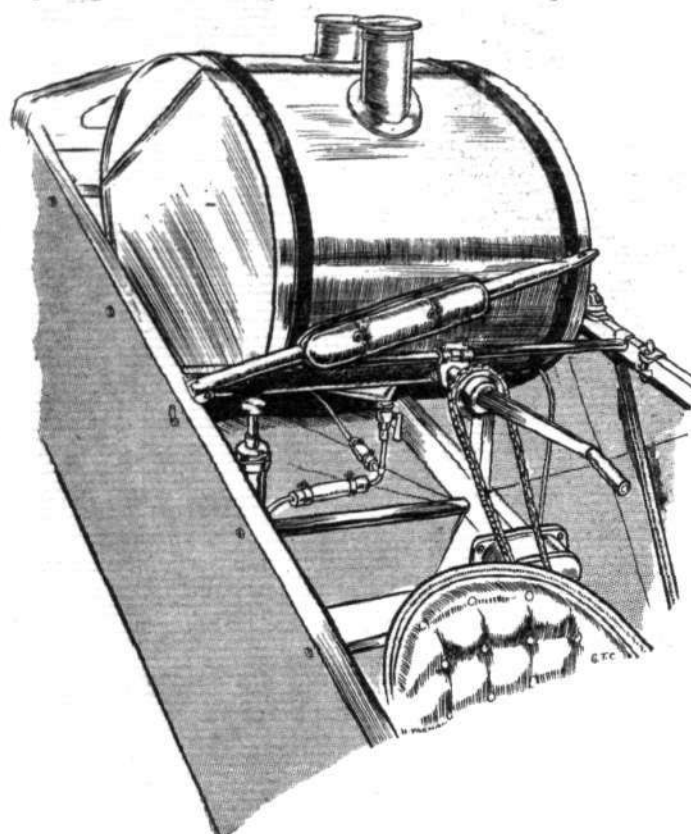
Glorious weather favoured the flying exhibitions on Sunday, and there was again a large attendance in all the enclosures. The following contributed to the afternoon's flying:—Claude Grahame-White, R. H. Carr, and Louis Noel made several trips on the G.-W. five-seater aerobus, three or four passengers being taken up at a time. F. W. Goodden went up on the 60 h.p. Caudron, and looped several times, and Philippe Marty also gave looping demonstrations on the 60 h.p. Morane-Saulnier, and ascended to an altitude of 7,500 ft. P. Verrier flew two new Farman biplanes—one at a time, of course—and numerous other flights were made by E. Baumann on the 40 h.p. Wright, J. L. Hall on his 50 h.p. Avro, L. A. Strange on the G.-W. tractor biplane "Lizzie," and W. Birchenough, J. M. Cripps, and R. J. Lillywhite on G.-W. 'buses. Marty's unfortunate accident occurred at about 6 o'clock. He was descending from one of his brilliant exhibitions with a rather steep dive, and when about 150 feet from the ground he started a spiral, which got sharper and sharper, until finally the machine plunged nose first to the ground, not far from No. 1 pylon. The machine struck the ground with such force that the fuselage telescoped, breaking in half just behind the unfortunate pilot, whilst the rest of the machine was totally wrecked. Marty was removed from the wreckage with difficulty, and though he was still alive it was seen that he was terribly injured, but fortunately unconscious. After being carried to the aerodrome hospital, where he received first aid, he was removed to the Central London Sick Asylum, and there passed away. Poor little Marty was only 21 years old, yet a magnificent and careful flyer. He was very popular everywhere in aviation circles, his unassuming, good-natured manners charming all who met him, and so he will be missed by many. How his accident originated is yet to be ascertained, but there is little doubt that had he been higher up when the machine got out of control, he would have been able to save himself.



A remarkable photograph secured by Mons. E. Marchessaux at Monaco on April 20th, during the final contest for the Schneider Aviation Cup.—This negative is absolutely untouched, and shows Mr. Howard Pixton's Sopwith machine passing the Franco-British seaplane piloted by M. Burri. The above is one of the autograph photographs of the amateur photographer which he presented to the two pilots who finished for this cup.

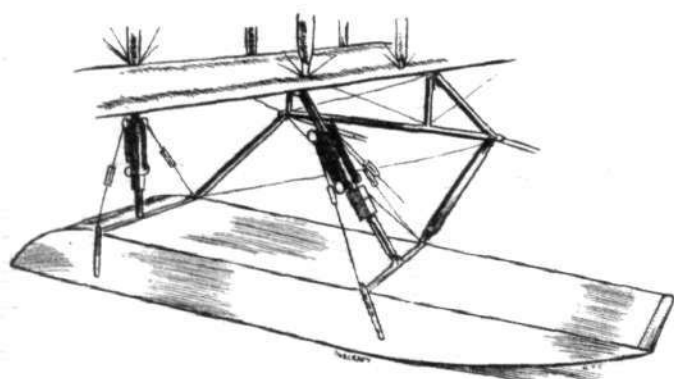
THE HENRY FARMAN SEAPLANE.

Of the difficulties which confront the designer of water-planes none is perhaps greater than that of making adequate provision for the absorption of shocks due to alighting on the surface of the water. A study of some



"Flight" Copyright.
Sketch showing starting handle and petrol tank mounting on H. Farman seaplane.

of the most successful waterplanes appears to indicate that the systems employed by designers fall into three categories. One type is characterized by flat-bottomed floats flexibly suspended from the chassis, another has rigidly mounted floats with either "V" shaped or rounded bottoms, which serve to lessen the shock when alighting,

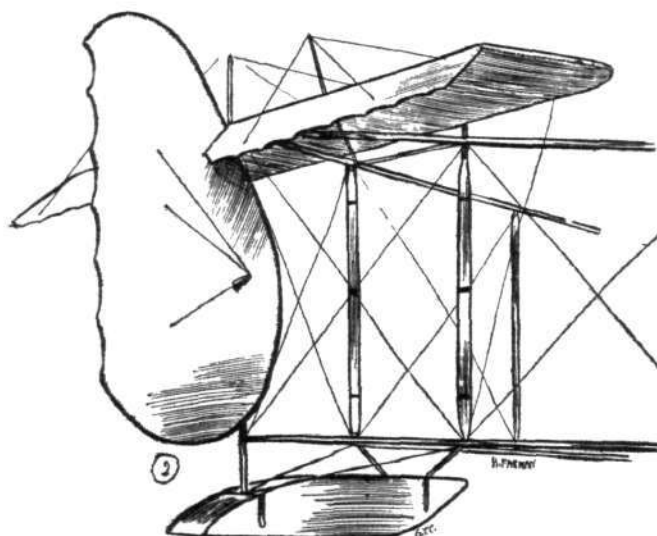


Flight" Copyright.
One of the main floats with its attachment on the H. Farman seaplane, and on right the tail float.

since they allow the float to sink partly into the water, thus gradually taking the load as the amount of displacement is increased, while the third type is in reality a combination of the other two, having floats with rounded or "V" shaped bottoms flexibly mounted. It will be readily

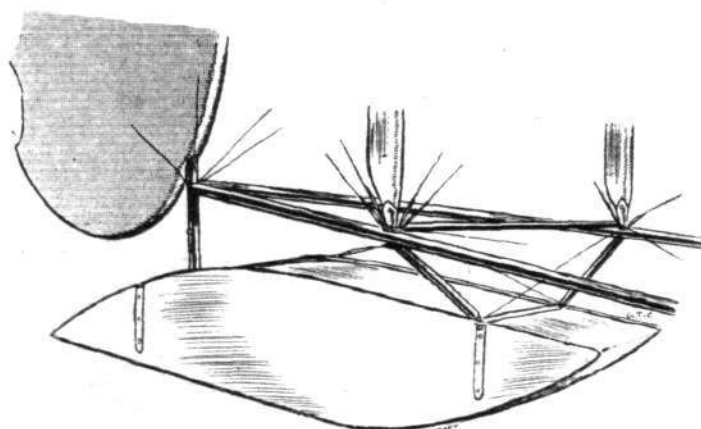
seen that in the third type a form of progressive springing may be obtained by suitably proportioning the shape of the float bottom and the flexibility of the shock absorbers. It is too early yet to venture an opinion as to which type will ultimately survive, but the method of springing the floats in the Henry Farman seaplane, which belongs to the first-mentioned type, is so ingenious as to entitle this machine to special attention on that account only, apart from any other merits it may possess.

The machine itself differs in detail only from the land machines of the same make, which are already familiar to our readers, such alterations as have been effected being more in the nature of detail improvements and general dimensions; as an aeroplane the machine remains unaltered. One of the characteristics of the Henry

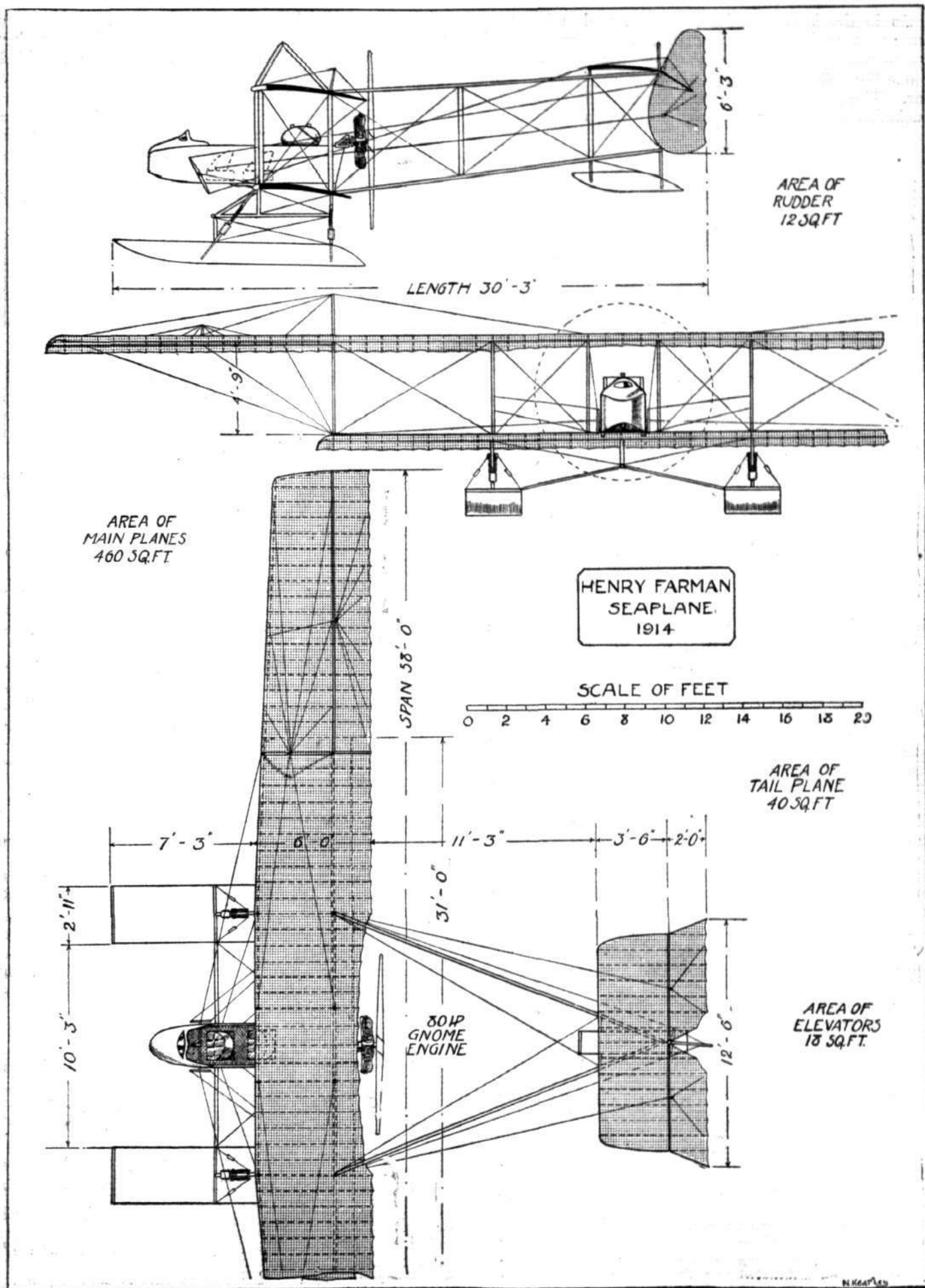


"Flight" Copyright.
Tail planes and float of H. Farman seaplane.

Farman biplane that has been retained in this machine is the comparatively small gap between the planes. This is all the more noticeable on account of the increased span of the upper plane, which has an even greater overhang than that of the land machines. The reason for increasing the span is no doubt that, in order

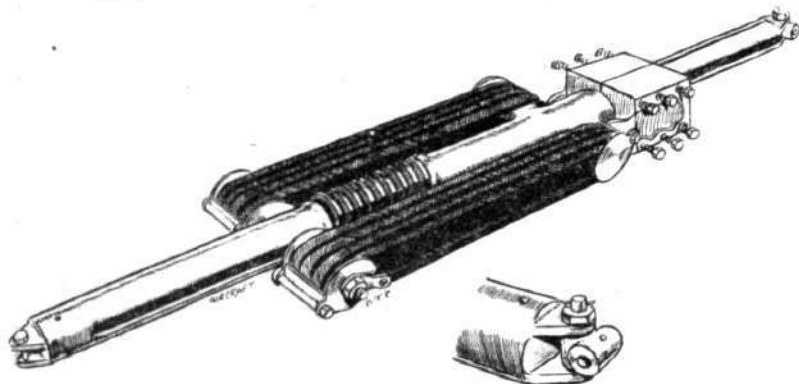


to carry the extra weight of the floats, and still keep the loading reasonably low, greater area is required, and also the extra resistance on the upper plane helps to counteract the added resistance of the floats over that of the land chassis.

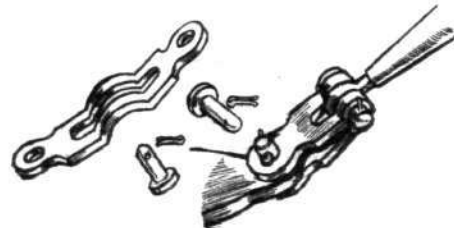


H. FARMAN SEAPLANE.—Plan, side and front elevations to scale.

As in the land machines, compensated *ailerons* of large area are fitted to the upper plane extensions, and are operated by the usual Farman type control lever, whilst the balanced rudder is actuated by a pivoted foot bar. The pilot's and observer's seats, which are of the bucket type, and made of aluminium, are arranged tandem

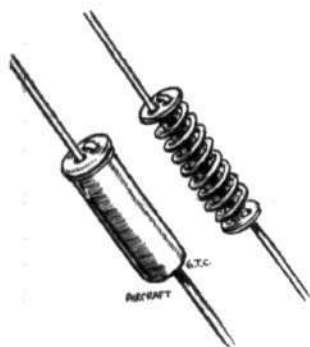


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Detailed sketch showing method of springing on H. Farman seaplane.



A neat steel clip which takes the place of the usual chain link.

fashion on a long tool box. Behind the passenger's seat is a starting handle as shown in one of the accompanying sketches, and the back rest of the seat is pivoted at one end so that it may be swung upwards out of the way to provide clearance for the starting handle.



The coil springs incorporated in chassis stay wires.

The petrol and oil tanks are mounted on transverse steel tubes resting on the upper *longerons* of the *nacelle*, thus ensuring a free flow of petrol from the tank to the carburettor in all ordinary positions of the machine. An interesting point in connection with the construction of the *nacelle* is the employment of steel-tube *longerons* in the front portion. This method of construction has the advantage, amongst others, that there is no wood to splinter and injure the pilot in case of a smash. In the rear portion of the *nacelle*, where they serve as supports for the engine bearers, the *longerons* are of wood, thus lessening the vibration. The engine—an 80 h.p. Gnome—is mounted on overhung bearings, and sufficient clearance is provided for the propeller by cutting away part of the trailing edge of the upper plane.

The two main floats, which are of the plain non-stepped

type, are supported each on two telescopic steel tubes carrying cross-pieces that serve as anchorage for the rubber shock absorbers. The telescopic tubes are provided with universal joints at both ends to allow of the free movement of the floats. From the upper cross-piece, which is welded to the lower telescopic tube, wires are taken to the gunwales of the floats. These wires have incorporated in them small coil springs enclosed in metal casings, as shown in the accompanying sketch, so that the floats are free to oscillate slightly around their longitudinal axis.

Oblique transverse tubes run from the inner gunwales of the floats to a central tubular structure coming down from the *nacelle*. These tubes are attached to the structure by means of a hinged joint, whilst their attachment to the floats is by means of a ball-and-socket joint in order to allow of the upward travel of the float. The object of the hinged joint at the point of attachment to the central structure is to allow the outer ends of the tubes to travel upwards with the float whilst at the same time preventing the tubes from turning broadside on.

It will thus be seen that each float is capable of three separate movements, *i.e.*, it can move upwards and downwards bodily, it can rock slightly round its longitudinal axis, and, finally, as both front and rear chassis struts are provided with shock absorbers, the float can oscillate round its transverse axis. Under actual working conditions the movements of the floats are of course combinations of the three above-mentioned movements of which the floats are capable. The flexibility of this arrangement is enormous as each float can adapt itself independently of the other to the unevenness of a rough sea.

A small float supported on four steel tubes takes the weight of the tail planes when the machine is at rest on the surface of the sea. The workmanship in the Farman machines already enjoys such an excellent reputation that it is unnecessary to enlarge upon it here—suffice it to say that, in the machine described, the workmanship is well up to the usual high standard maintained by the Aircraft Manufacturing Co.

The workshops are now being fitted up with power-driven plant.

No. 5 Squadron. S. Farnborough.—The Squadron was engaged throughout the week on a practice mobilization. On Thursday, the 23rd, the Squadron was fully mobilized, and was inspected by the Director-General of Military Aeronautics and by the Aldershot Command Headquarter Staff. De-mobilization commenced on Friday.

No. 6 Squadron. S. Farnborough.—Reconnaissance flights over the country round Aldershot were carried out daily.

Flying Dépôt. S. Farnborough.—The Flying Dépôt was fully occupied with repair work to aircraft and mechanical transport, with assisting the Aeronautical Inspection Department, and the technical training of recruits.

Headquarter Flight. S. Farnborough.—Much flying was done in connection with experimental work. Numerous kite and free balloon ascents were also made.

ROYAL FLYING CORPS (MILITARY WING).

WAR OFFICE summary of work for week ending April 25th:—

No. 2 Squadron. Montrose.—The pilots of all three "flights" were out daily making reconnaissances, amongst other places to Edinburgh and Berwick, to select landing grounds. Lieut. Dawes flew from Farnborough to Montrose on Monday, the 20th, landing twice *en route* to fill up with petrol. His machine was a 70 h.p. Renault B.E. Lieut. Empson arrived at Montrose on Friday, 24th, on a Maurice Farman, having left Farnborough two days previously.

No. 3 Squadron. Netheravon.—In "C" Flight alone 2,000 miles were covered during the week. A reconnaissance scheme in conjunction with the Royal Engineers was carried out, and successful experiments with aerial photography were continued.

No. 4 Squadron. Netheravon.—Numerous flights were made daily, including several by Warrant and Non-Commissioned Officers.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

JACQUES SCHNEIDER INTERNATIONAL MARITIME RACE.

Luncheon to Mr. T. O. M. Sopwith and Mr. Howard Pixton.

To celebrate the British victory at Monaco on April 20th, 1914, the Royal Aero Club will entertain Mr. T. O. M. Sopwith and Mr. Howard Pixton to luncheon at the Royal Automobile Club, Pall Mall, S.W. (by kind permission) on Tuesday, May 12th, 1914, at 1.15 p.m.

The Marquess of Tullibardine, M.V.O., D.S.O., M.P., the Chairman of the Club, will preside.

In order to facilitate the arrangements, Members are requested to notify the Secretary as early as possible, if it is their intention to be present.

Tickets, inclusive of wines, 10s. 6d. each.

Members are notified that on this occasion they may be accompanied by one guest only.

HAROLD E. PERRIN, Secretary.

Royal Aero Club,
166, Piccadilly, W.

Committee Meeting.

A MEETING of the Committee was held on Tuesday, April 28th, 1914, when there were present:—Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Prof. A. K. Huntington, Major F. Lindsay Lloyd, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. Alec Ogilvie, Mr. Mervyn O'Gorman, C.B., Mr. C. F. Pollock, Com. C. R. Samson, R.N., and the Secretary.

New Members.—The following new Members were elected:—Lieut. I. M. Bonham-Carter, Leonard Carter, G. B. M. Fleming, Aubrey Hyman, Henri André Jouve, W. Joynson-Hicks, M.P., C. F. Lan-Davis, Prince Leon Sapieha de Koden, S. A. Screeton, E. O. Musgrove Slatter, and Frederick Wilkinson.

Aviators' Certificates.—The following Aviators' Certificates were granted:—

- 762 2nd Lieut. John Bruce Bolitho (Devonshire Regiment) (Bristol Biplane, Bristol School, Salisbury Plain). April 15th, 1914.
- 763 Prince Leon Sapieha (Austrian Subject) (Grahame-White Biplane, Grahame-White School, Hendon). April 15th, 1914.
- 764 2nd Lieut. John Bower Harman, R.F.A. (Bristol Biplane, Bristol School, Salisbury Plain). April 15th, 1914.
- 765 (Hydro-aeroplane) Oswald Lancaster (Hydro-aeroplane, Lakes Flying Co., Lake Windermere). April 15th, 1914.
- 766 Comte Jacques de Fitz-James (Vickers Biplane, Vickers School, Brooklands). April 16th, 1914.
(Subject to permission of Aero-Club de France.)
- 767 Ernest Victor Samuel Wilberforce (Vickers Biplane, Vickers School, Brooklands). April 16th, 1914.
- 768 Mark Dawson (Vickers Biplane, Vickers School, Brooklands). April 16th, 1914.
- 769 George Carruthers (Caudron Biplane, Ewen School, Hendon). April 21st, 1914.
- 770 Geoffrey Charles Gold (Blériot Monoplane, Blériot School, Hendon). April 21st, 1914.
- 771 Lieut. Philip Stafford Myburgh, R.F.A. (Bristol Biplane, Bristol School, Salisbury Plain). April 21st, 1914.
- 772 Lieut. Reynell Henry Verney, A.S.C. (Caudron Biplane, Ewen School, Hendon). April 22nd, 1914.
- 773 Lieut. William Henry Dyke Acland (Vickers Biplane, Vickers School, Brooklands). April 22nd, 1914.

Jacques Schneider International Maritime Race.—The following is the translation of a letter received from the Aero Club de France:—

"We have great pleasure in sending you our most hearty congratulations on your recent brilliant victory in the Jacques Schneider International Maritime Race.

"We had hoped indeed, to retain this valuable trophy, but it is a consolation to us that it has been won by a nation who is the friend of France, whose Aero Club entertains the best relations with you.

"We are pleased to take advantage of the visit of your King to Paris at the present time to send you our heartiest greetings and best wishes for your prosperity."

Luncheon to Mr. T. O. M. Sopwith and Mr. C. Howard Pixton.
—The Committee being of opinion that many Members of the Club would like to join in celebrating this splendid British victory, it was decided to entertain Mr. Sopwith and Mr. Pixton to luncheon. The Secretary was instructed to make the necessary arrangements, particulars of which appear in these notices.

Age Limit for Aviators' Certificates.—On the motion of Mr. Mervyn O'Gorman, C.B., seconded by Mr. Frank McClean, it was unanimously resolved to recommend to the Fédération Aéronautique Internationale at its next meeting that the age limit be reduced from 18 years to 17 years.

British Altitude Records.—The report of the National Physical Laboratory on the barographs used by Eng.-Lieut. E. F. Briggs, R.N., in his flight on a Blériot Monoplane, on March 11th, 1914, at Eastchurch was considered. It was unanimously resolved that the British Altitude Record for pilot alone be granted to Eng.-Lieut. E. F. Briggs, R.N., the height accomplished being 14,920 ft. The previous Record was held by Capt. J. M. Salmond, R.F.C., being 13,140 feet.

Appointment of Timekeepers.—The following Official Timekeepers were appointed for the year 1914:—

F. T. Bidlake	T. D. Dutton	C. P. Glazebrook	A. G. Reynolds
J. H. Burley	A. V. Ebbelwhite	H. Hewitt Griffin	Z. Wheatley
A. Deacon	A. Fattorini		

F.A.I., Conference, Paris.—Mr. Griffith Brewer and Mr. J. T. C. Moore-Brabazon were appointed to attend the Extraordinary Conference of the F.A.I., to be held in Paris on Tuesday next, May 5th, 1914. This Conference will be attended by delegates from all countries, and it is expected that Officials from the various Governments will also be present. The object of this Conference is to discuss fully, the question of Aerial Navigation Regulations and particularly Prohibited Areas.

Flying to the Danger of the Public at Brooklands.—The Committee had before them reports received from the Brooklands Automobile Racing Club, regarding the flying of Mr. C. F. Lan-Davis over the Public Enclosures at Brooklands at a low altitude on Saturday, April 11th, 1914.

Mr. C. F. Lan-Davis was called before the Committee to explain the circumstances.

The Committee found that the flying was of a nature which endangered the public and showed great lack of judgment. Taking into consideration his limited experience, the Committee decided to confine the punishment to a severe censure and to caution him as to his future flying.

Public Safety and Accidents Investigation Committee.

A meeting of the Public Safety and Accidents Investigation Committee was held on Tuesday, April 28th, 1914, when there were present:—Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Eng.-Lieut. E. F. Briggs, R.N., Mr. F. K. McClean, Mr. Alec Ogilvie, Major-Gen. R. M. Ruck, C.B., R.E., Com. C. R. Samson, R.N., and the Secretary.

Col. H. C. L. Holden, C.B., F.R.S., was unanimously elected Chairman for the year.

Fatal Accident to Sergeant E. N. Deane.—The Committee received the report of the Club's representative, and eye-witnesses of the accident attended and gave evidence.

The report of the Committee was drawn up and ordered to be submitted to the Committee.

Fatal Accident to Mr. G. L. Gipps.—Draft report was considered and passed and ordered to be submitted to the Committee.

The enquiry into the accidents of Capt. C. P. Downer, Capt. C. R. W. Allen, Lieut. J. E. G. Burroughs, Lieut. H. F. Treeby, and Mr. E. T. Haynes was deferred.

Competitions Committee.

A meeting of the Competitions Committee was held on Thursday, April, 23rd, 1914, when there were present: Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Mr. Ernest C. Bucknall, Major F. Lindsay Lloyd, Mr. F. K. McClean, and the Secretary.

Gordon-Bennett Eliminating Trials.—The arrangements for the Gordon-Bennett Eliminating Trials were discussed. It was decided to allow each entrant to fly three machines in the Eliminating Trials.

The Secretary was instructed to ascertain from the War Office if arrangements could be made for holding the Trials on Salisbury Plain towards the end of August.

It was decided to invite the entrants to the next meeting of the Competitions Committee to discuss the details of the Trials. This meeting will be held on Thursday, May 7th, 1914, at 4 p.m.

Royal Aero Club Golf Match.

A golf match has been arranged between the Royal Aero Club and the Royal Automobile Club, and will take place at Huntercombe

on Thursday, May 21st, 1914. The match will be eight a side, and will be played on handicap, singles in the morning and foursomes in the afternoon.

Members wishing to take part are requested to communicate with the Secretary, stating their handicap.

166, Piccadilly, W.

HAROLD E. PERRIN, Secretary.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

MONDAY, last week, the following machines were up:—No. 27 Sopwith, 80 h.p.; 40 Caudron, 50 h.p.; 3 Short, 80 h.p.; 50 B.E., 70 h.p. Renault; 65 Short, 80 h.p., cross-country to Chatham and back; 39 Blériot, 80 h.p. Le Rhone; 16 Avro, 100 h.p.

Tuesday, No. 34 Short, 50 h.p.; 66 Short, 80 h.p., gun machine.

The following made a fine flight to Dover, flying over the Royal yacht in the harbour before leaving for France and returning:—No. 50 B.E. Renault, 70 h.p., Com. Samson; 39 Blériot, 80 h.p. Le Rhone, Lieut. Briggs; 40 Caudron, 50 h.p., Lieut. Osmond; 27 Sopwith, 80 h.p., Sub-Lieut. Littleton; 16 Avro, 100 h.p., Sub-Lieut. Pierce; 3 Short, Sub-Lieut. Rainey, 80 h.p.; 34 Short, 50 h.p., Private Edmonds, R.M.L.I.; Flight Com. Seddon also flew from Isle of Grain.

Wednesday, fine morning, storm midday. No. 2 Short 50 h.p. to Isle of Grain and back; 10 Short, 140 h.p.; 39 Blériot, 80 h.p. Le Rhone; 66 Short, 80 h.p., gun machine. The following were scouting nearly all day:—No. 3 Short, 80 h.p., Lieut. Finch-Noyes; 16 Avro, 100 h.p., Sub-Lieut. Pierce; 27 Sopwith, 80 h.p., Lieut. Littleton; 34 Short, 50 h.p., Private Edmonds, R.M.L.I.

Thursday, rained early morning, later fine. Major Gerrard, R.M.L.I., on B.E. 70 h.p. Renault, arrived from Central Flying School; also Lieut. Babbington, R.N., on B.E. 70 h.p. The following were again scouting: No. 65 Short, 80 h.p., Lieut. Osmond; 3 Short, 80 h.p., Lieut. Finch-Noyes; 27 Sopwith, 80 h.p., Lieut. Rainey; 16 Avro, 100 h.p., Sub-Lieut. Pierce; 34 Short, 50 h.p., Private Edmonds, R.M.L.I.; also up, 10 Short, 140 h.p.; 39 Blériot, 80 h.p. Le Rhone; 104 Sopwith, 80 h.p.

Friday, fine, rather windy. More scouting, the following being up: 39 Blériot, 80 h.p. Le Rhone, Lieut. Briggs; 49 B.E., 70 h.p. Renault, Lieut. Osmond; 3 Short, 80 h.p., Sub-Lieut. Young; 65 Short, 80 h.p., Lieut. Vernon; 27 Sopwith, 80 h.p., Sub-Lieut. Rainey; 104 Sopwith, 80 h.p., Sub-Lieut. Marix; 10 Short, 140 h.p., Com. Samson; 2 Short, 50 h.p., P.-O. Andrews; 34 Short, 50 h.p., Private Edmonds, R.M.L.I.; two flights 27 Sopwith, 80 h.p., machine gun practice.

Saturday, fine. Major Gerrard, B.E., 70 Renault; Lieut. Babbington, B.E., 70 Renault, returned to Central Flying School; Sub-Lieut. Rainey on 27 Sopwith, 80 h.p., with passenger, flew to Southampton; 2 Short 50 h.p., 10 Short 140 h.p., 3 Short 80 h.p., and 39 Blériot 80 h.p. Le Rhone were also up.

Mr. Churchill, accompanied by Lieut. Spencer Grey, visited the aerodrome, and made an inspection, returning to the Isle of Grain about midday.

Civilian Flying.—Monday, the Hon. M. Egerton was out on his 50 h.p. Short. Mr. Sydney Pickles made a fine flight to Whitstable and back on his 50 h.p. Blériot-Anzani.

Tuesday, the Hon. M. Egerton was again out.

Wednesday, Mr. Sydney Pickles started for Hendon on his 50 h.p. Blériot, with M. S. Marsden as passenger, but ran into a storm near Gillingham and had to return.

Thursday, Mr. Ogilvie was out first on his Wright 50 N.E.C. engine, second on new machine, same type, 25 h.p.; this machine is very smart, considering the h.p., and climbs beautifully. Mr. Sydney Pickles was also out.

Friday, Hon. M. Egerton and Mr. F. McClean were out.

Saturday, Mr. F. McClean made two flights with passengers.

Sunday, fine. Hon. M. Egerton two flights, Prof. Huntington two and taxiing grounds with passenger. Mr. Ogilvie on both his machines. Mr. Jezzi testing engine.

Brooklands Aerodrome.

ON Monday morning, last week, the Vickers and Bristol Schools were working. In the afternoon, Herr Roempler was out on the D.F.W. biplane, Mr. Waterfall on the Martinsyde monoplane, and Lord Edward Grosvenor's mechanic was tuning up his 50 h.p. Blériot. The Vickers pupils were again at work. The wind velocity registered was up to 22 m.p.h.

Capt. Herbert arrived from Netheravon on a Maurice Farman biplane on Tuesday morning. Herr Hans Vollmuller arrived on the Albatros biplane from Farnborough with Major Brooke-Popham as passenger. In the afternoon, Mr. Waterfall (with Mr. Guy Blatherwick as passenger) flew to Farnborough. Capt. Herbert returned to Netheravon on the Maurice Farman with Major Brooke-Popham

as passenger. Mr. Alcock made several flights on the Sunbeam-engined Maurice Farman. Lieut. Collett had a flight on the Albatros biplane, with which he was much impressed. The Vickers pupils were busy. Mr. Barnwell circled round the Parseval airship, which was on its way back from Dover. Lieut. de Havilland arrived with a passenger from Farnborough. Wind blowing up to 18 m.p.h.

The Vickers pupils were out on Wednesday. The Sopwith "scout" biplane flew to Farnborough. Mr. W. H. Dyke Ackland passed his tests in excellent style on a Vickers biplane, rising to 1,200 ft. in the altitude tests. Wind blowing up to 26 m.p.h.

On Thursday, Mr. Merriam was testing a new Bristol biplane, and was afterwards engaged with pupils. In the afternoon, Lieut. Robin Grey arrived from Farnborough on a 50 h.p. Avro. Mr. Barnwell was flying across country with a pupil on the 70 h.p. Vickers biplane. The Bristol and Vickers Schools were at work. Wind blowing up to 29 m.p.h.

On Friday, the Vickers and Bristol pupils were busy. Lieut. Robin Grey left for Eastbourne on the 50 h.p. Avro. Arrival of Lord Edward Grosvenor's second Blériot monoplane (two-seater 80 h.p. Le Rhone). In the afternoon Lieut. Collett made a couple of flights on the Albatros biplane, after which Herr Vollmuller made a flight. Mr. Waterfall arrived back from Farnborough on the Martinsyde monoplane. Arrival of No. 2 Sopwith "scout" biplane; erection and engine-testing. Mr. Gustav Hamel flew the Albatros biplane (his first trip on a biplane). Wind velocity up to 31 m.p.h.

Lieut. Collett, on Saturday, took Comte James Fitzjames for a flight on the Albatros biplane. Mr. Barnwell was testing the 100 h.p. Vickers gun-carrying biplane. Lieut. Collett made a number of fine flights on the D.F.W. biplane, as did Herr Vollmuller on the Albatros biplane. Mr. Pixton was out on the No. 2 Sopwith "scout" biplane. Mr. Raynham was testing the A.B.C.-engined Avro biplane.

On Sunday, fine exhibition flights were made by Mr. Pixton on the Sopwith "scout" biplane, Herr Vollmuller on the Albatros biplane, Mr. Merriam on the Bristol biplane, Mr. Knight on the Vickers biplane, and Mr. Raynham on the Sopwith "scout" biplane. The winners of the ballot for the free passenger flights—Mr. Herbert Evans, 4, Hollick Buildings, Woking, and Mr. Douglas William Henderson, 203, Oxford Road, Reading—were taken for flights respectively by Herr Vollmuller on the Albatros, and Mr. Merriam on the Bristol biplanes.

Bristol School.—Monday, last week, passenger tuition was given to Lieut. Britten, Lieut. Smithies, and Lieut. Mills (new pupil). Lieut. Smithies followed with solo circuits. Tuesday and Wednesday, owing to the strong breeze, the pupils assisted in the repair and erection of machines in the hangars.

A new school biplane was brought and tested by Merriam, Thursday, who then took Lieut. Mills for a passenger flight on straights and circuits. Mr. Eastwood (new pupil) was afterwards taken for his first trip. Merriam then gave tuition to Mr. Racine Jacques and Lieut. Mills.

Friday, passenger tuition to Mr. Lucas and Lieut. Mills. The wind then prevented further school work.

Tuition impossible Saturday owing to bad weather.

Vickers School.—Monday, last week, Barnwell, Elsdon and Knight on biplanes, with Major Phillips, Lieuts. Wood-Smith, Farie and Leighton. Lieuts. Acland and Leighton solos.

Tuesday, Barnwell, Elsdon and Knight on biplanes with Major Phillips, Lieuts. Acland and Wood-Smith, and Messrs. Murray, Liddell and Collins. Mr. Hinshelwood on Blériot mono. Knight and Elsdon on biplane with Lieut. Underhill.

Knight and Elsdon on biplanes, Wednesday, with Major Phillips, Lieuts. Farie and Wood-Smith, and Messrs. Liddell, Collins and Murray. Lieuts. Underhill and Acland solos. Lieut. Acland for *brevet*, getting through in fine style.

Thursday, Barnwell, Knight and Elsdon on biplanes with Major Phillips, Lieuts. Wood-Smith and Underhill, and Messrs. Murray, Liddell and Collins.

Barnwell, Knight, Elsdon and Webb on biplanes, Friday, with Major Phillips, Lieuts. Underhill and Wood-Smith, and Messrs. Liddell and Collins. Lieuts. Underhill and Leighton and Mr. Liddell, solos.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Monday, last week, Mr. Weber rolling with Instructor Howarth and straights with Instructor Strange. Messrs. Smiles and Parker solo straights, circuits, &c., Major Piercy straights with Instructors and alone. Messrs. Boyesen, Robinson, Lowe, Moore, Cowley, Norris straights with Instructors Strange, Howarth, and Cripps in passenger seat.

Tuesday, Messrs. Parker, Smiles, and North solo circuits, figures of eight, &c., Messrs. Weber, Cowley, Moore, Robinson straights with Instructors Howarth, Strange, and Cripps. Mr. Peck (new pupil) rolling with Mr. Cripps. Major Piercy solo straights.

Wednesday, Mr. Peck rolling alone. Messrs. Weber, Robinson, Cowley, Peck, Moore, straights with Instructors Strange and Howarth in passenger seat. Messrs. Parker, Smiles, and Major Piercy solo straights, circuits, &c. Mr. Moore solo straights.

Friday, Major Piercy and Mr. Parker straights, circuits, &c. Messrs. Boyesen, Cowley, Peck straights with Instructors Howarth and Strange.

Beatty School.—Pupils up with Instructor Baumann on dual-control Wright machine last week. Monday morning, Messrs. Ding 12 mins., Watts 5 mins., Ruffy 15 mins., Stewart 7 mins., Hodgson 10 mins., Bentley 10 mins., Major Piercy 22 mins. Afternoon, Messrs. Watts 20 mins., Ding 15 mins., Ruffy 10 mins., Bentley 8 mins., Stewart 8 mins., Hodgson 7 mins.

Tuesday morning, Ding 9 mins., Bentley 10 mins., Watts 5 mins., Ruffy 10 mins., Hodgson 11 mins. Afternoon, Watts 12 mins., Ding 10 mins., Ruffy 7 mins., and Major Piercy's son was taken up by Baumann for a joy ride.

Wednesday, Ding 15 mins., Ruffy 9 mins., Watts 18 mins., Bentley 10 mins., Piercy 8 mins., Hodgson 8 mins. During the Wednesday morning training Mr. Ding was up by himself doing circuits in very good style, then Mr. Ruffy went up with Baumann, and did some very good figures of "8"; afterwards Mr. Watts took the machine up by himself, and seems to be handling it very well.

On Thursday Mr. Baumann took part in the night flying, and made some very good flights.

Friday, Messrs. Ding 9 mins., Garvin 4 mins.

W. H. Ewen School.—School was out on Monday, last week, at 6 a.m. After test flight by Mr. W. T. Warren on *brevet* machine Mr. G. Carruthers did several circuits and figures of eight.

Tuesday morning school out at 5.30 o'clock, Mr. Verney doing straights and circuits, after which Mr. G. Carruthers went through his *brevet* tests in excellent style, climbing 800 ft.

After test flight Wednesday at 6 a.m. by Mr. W. T. Warren on *brevet* machine, Mr. Verney did circuits and figures of eight, after-



Mr. J. Bankes-Price, who recently passed his *brevet* tests on a 35 h.p. Caudron biplane at the W. H. Ewen School. Hendon.

wards going through the tests for the R.Ae.C. certificate in excellent style. Mr. R. McGregor did straights on 35 h.p. Caudron No. 1.

At 6 a.m. on Friday, Mr. Warren was out with pupils. After test flight by him, Mr. R. G. Garvin did straights and circuits, and Mr. McGregor straights.

Hall School.—Monday last week, Messrs. A. P. Arcies and P. Palmer had instructional flights on Avro at 1,000 ft. Later on in

day J. L. Hall, with H. C. G. Allen, mounted to 3,000 ft., and had beautiful view of sunset, afterwards descending in long *vol plané*.

Tuesday, J. L. Hall out on Avro, taking up Messrs. Haines and R. Gibson 500 ft., the latter taking snapshots. H. Gearing also had passenger flight 1,500 ft.

J. L. Hall, Wednesday, on Avro with pupils. Thursday, J. L. Hall exhibit flight. Friday, J. L. Hall taking instruction in



Mr. Victor S. Wilberforce, who last week took his *brevet* at the Vickers Flying School, Brooklands, on Vickers biplane.

morning. Messrs. A. Gibson and Harries doing straights on 25 Anzani, R. Gibson showing good progress for a beginner. J. L. Hall out testing No. 1 Caudron.

Saturday and Sunday, J. L. Hall exhibition on Avro.

Salisbury Plain.

Bristol School.—Passenger tuition Monday, last week, to Mr. Hay (3), Mr. Parker (4), Capt. Walcot (2), and Air-Mechanic Locker (2). Solo flights were made by Lieut. Myburgh (4), Lieut. Rabagliati (4), and Capt. Walcot. Lieut. Myburgh successfully completed the first two parts of his certificate tests.

Tuesday, Jullerot, Stutt, and Voigt gave tuition to Lieut. Rabagliati, Lieut. Smythies, Mr. Parker (2), and Mr. Hay (2): Air-Mechanic Locker, Capt. Walcot (2), Lieut. Myburgh, Lieut. Rabagliati, Lieut. Smythies made solos, after which Lieut. Myburgh completed his certificate tests at 720 ft.

Passenger tuition was given Wednesday to Mr. Parker (2), Mr. Hay (2), Mr. Gresley (2), and solo flights were executed by Capt. Walcot (2), Lieut. Smythies (3), Lieut. Rabagliati (4), Air-Mechanic Locker (3), and Mr. Hay.

Thursday, the weather was too bad for tuition to pupils, the wind continuing throughout remainder of the week.

Shoreham Aerodrome.

THE weather has been favourable for morning and evening flying every day last week, and much work has been done.

Pupils doing straights alone were: Ackman, Gates, Cannon, Sholt-Douglas, Mayland-Wilson, C. H. Maskall, A. Maskall, and each of these pupils have also been up a number of times on the Henry Farman-type machine with the pilot, Mr. W. H. Elliott.

On Sunday a considerable advance was made by the pupils, four of whom did their first circuit alone in the evening, these being Messrs. A. Maskall, R. C. Cannon, C. H. Maskall, and D. Ackman.

On Tuesday last, Mr. Elliott, with Mr. B. H. England as passenger, flew to Horsham on the school machine, returning on Wednesday morning to the 'drome at well over 3,000 ft.

Pashley School.—The Instructor for last week was C. L. Pashley. The following were up with instructor: Gray, Dawson and Mortimer. Straights alone by Gray and Mortimer, and circuits and eights by Hale and Mortimer.

THE RATIONAL DESIGN OF AEROPLANES.*

By ARCHIBALD R LOW, M.A., A.F.Ae.S.

AT the outset the author examines the nature of the assumption made in dealing with the flow of fluids in impulse turbines, and observes that the allowance to be made for the loss of energy due to turbulence or fluid friction is based on experiment and allowed for by empirical methods, while the path of a particle of fluid is undetermined. In hydrodynamics, he points out, the first step is the solution of the problem involved in the flow of a very large stream of fluid past a very long and narrow plane barrier, which problem is the fundamental problem of flight. The "cloud" of particles is now a cloud of mutually interfering particles, and this mutual interference renders invalid all attempts to predict the general motion of a large mass of fluid by analogy with the motion of a single particle; so that, while the results of hydrodynamics are of great interest and value from the point of view of giving a sound outlook on the nature of fluid flow, when it comes to getting reasonably accurate numerical values, we are thrown back on experimental methods. He proceeds to indicate that there is so great a difference between the actual reactions in fluid flow and those derived from hydrodynamical theory, as at present understood, that quantitative results cannot be entertained; but he gives several examples which show that hydrodynamics can be employed to predict the general course of experimental results. He observes that in aerodynamics we should try to form a correct picture of the lines of flow and then think in terms of velocities and pressures in accordance with Bernoulli's Theorem, and continues:—

Turning now to experimental work, most of the results to-day at our disposal are the result of wind-tunnel experiments. It has been definitely asserted by ill-informed writers that the reaction of still air on a moving surface differs from the reaction of uniformly moving air on a fixed surface in its nature. This assertion denies, of course, the relativity of motion, and so by implication Newton's laws. It is therefore necessary to restate the elementary fact that the discrepancies between wind-tunnel work and measurements on aeroplanes in mid-air, arise from the fact that the walls of the wind-tunnel reduce the mass of free air, and by their friction disturb the uniformity of flow, not to speak of lack of uniformity of intake. There is further the effect of the kinematic coefficient of viscosity in creating a certain lack of aerodynamic similitude. The same errors would be introduced if the air in the tunnel were still and the model were carried along it, with the exception of the effect of wall friction in creating lack of uniformity.

We therefore come to wind-tunnel experiment, knowing that many small sources of error exist, and, as far as those outside the National Physical Laboratory are concerned, not knowing whether the average absolute error in applying results to full-sized aeroplanes is 20 per cent, or 2 per cent.

Empirical Formulae.—The results of these experiments are expressed in the form

$$\begin{aligned} R &= KSV^2 \\ Y &= K_y SV^2 \\ X &= K_x SV^2 \end{aligned} \quad \text{where } K, K_y, K_x, \text{ are the coefficients of total reaction of lift and of drag.}$$

The assumption that the reaction and its components are proportional to the square of the velocity requires correction on account of the viscosity of air, but as these corrections are refinements beyond the scope of the present paper, it is sufficient to draw attention to the existence of the effect.

Now the object of every experimenter has been to express K_y , K_x as functions of the angle i of chord incidence.

It is needless to say that all such functions are empirical, and that on the closeness of the values given by the empirical formulae to the observed readings depends the usefulness of the formulae.

An example is shown in Fig. 1 of an experimental curve taken from Eiffel's work, and three empirical equations which differ only in substituting multiples of i for i , thus causing the curve of lift to fall off sooner. In this case the experimental curve of lift has its maximum at nearly $90^\circ \div 5$ or 18° of incidence. It is also found that the coefficients of lift and drag vary with the aspect ratio and with the camber, so that K_y and K_x are functions of incidence, camber, and aspect ratio.

Another form of the equations is

$$R = k(\Delta + g)SV^2, \quad Y = k_y(\Delta + g)SV^2, \quad X = k_x(\Delta + g)SV^2, \quad \text{where } \Delta \text{ is the weight of unit volume of air, } g \text{ the acceleration of gravity, whence } K = k(\Delta + g), K_y = k_y(\Delta + g), K_x = k_x(\Delta + g).$$

The dimensions of K , K_y , K_x , are those of

$$\frac{R}{SV^2} = \frac{[MLT^{-2}]}{[L^2L^2T^{-2}]} = [M]$$

which are the dimensions of density. The dimensions of k , k_y , k_x , are zero, since K and $\Delta + g$ have both the dimensions of density. Using then the coefficients k , k_y , k_x , of zero dimensions, the follow-

ing empirical expression follows, fairly closely, a wide range of values for various cambers and aspect ratios:—

$$\begin{aligned} k_y &= [.53 + .10\psi] \sin^2 .6 a^2 i + .20\psi \\ k_x &= .48 [\sin^2 .3 a^2 i]^2 + .05\psi + .010 \end{aligned}$$

a^2 is the aspect ratio, so that if the surface is y^2 the sides of the (assumed) rectangular wing are ay and y/a . ψ is the angle, in radians, between the tangents at the leading and trailing edges

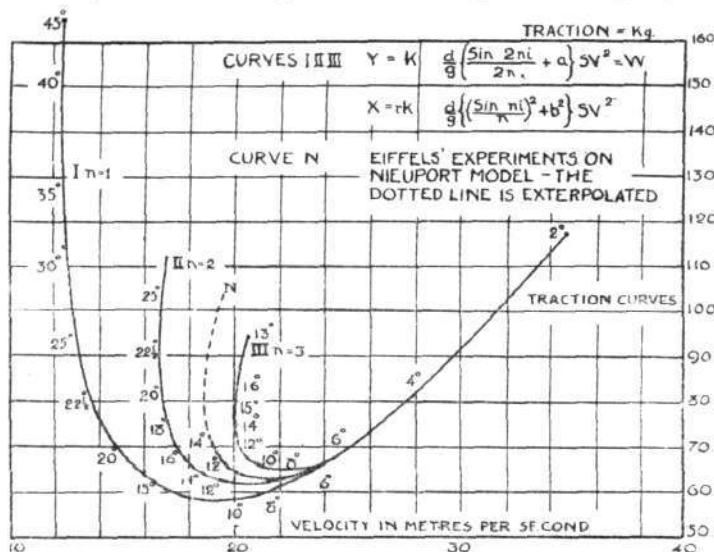


Fig. 1.

taken on the upper surface just before the edges are rounded off on small radii. These are for surfaces of cylindrical section only. Surfaces with sections of variable curvature may be compared with the nearest cylindrical surface.

The following table gives values of ψ for different cambers:—

Camber.	Arc in radians.	Camber.	Arc in radians.
0	0	1 in 16	.50
1 in 30	.027	1 in 13.5	.059
1 in 27	.030	1 in 12	.066
1 in 20	.40	1 in 8	.098

In order to find the best gliding angle for a lifting surface only, it is necessary to take the ratio k_y/k_x and differentiate with respect to it a^2 , and ψ and equate the partial differential coefficients to zero. This gives three equations between the three variables, and a solution is, therefore, obtainable if it exists. In practice, however, every engineer will prefer to draw curves of the ratio k_y/k_x and choose the best.

It is found that there is no limit to the increase of the aspect ratio, but that the best camber is about 1-20 or $\psi = .40$. This best gliding angle for surface only is often assumed to give the best gliding angle for the whole machine.

But here we must assume a constant added to k_x to account for stanchions and bracing which increase with the surface, and another constant to $k_x (\Delta + g) S$ to represent the head resistance of the body and undercarriage, which are practically independent of the surface, so that the gliding ratio of the whole machine becomes $k_y \div (k_x + C_1 + C_2 + S)$.

The gliding ratio is thus a function of the surface which in turn is a function of the horse-power, velocity and total weight, &c.

The variables which we have to introduce are—Surface, aspect ratio, camber, incidence, horse-power, useful weight, engine weight, glider weight, total weight. Of which any five may be taken as independent, the other as dependent. In order to solve formally for the best wing section for the whole machine, we have at least five variables, and the five partial differential coefficients of k_y/k_x with respect to these variables equated to zero, give the necessary equations for solution.

The lesson to be immediately drawn is that the problem of finding the best camber, chord, span, and incidence for a given machine is not so simple as that of finding the best proportions for wing only. Trial and error in the design room and tests in the field seem to indicate a camber of about 1 in 15 as a good average. It is possible, but unlikely, that further investigation will gain an appreciable advantage over the slow and costly process of trial and error.

Of air screws, scarcely anything can be said here, save that recent research by Mr. Bramwell of the National Physical Laboratory, has confirmed the hypothesis of Drzewiecki, first applied to water screws

* Abstract from a paper read before the Aeronautical Society of Great Britain on March 4th, 1914.

in 1882, that the analogy of lifting surfaces may be applied to elements of the blades. An assumed efficiency of seventy per cent. between thrust horse-power and torque horse-power is quite sufficiently accurate for all practical discussion of the general run of phenomena.

Stress Calculations.—It is now necessary to introduce the question of stress calculations. Each wing or supporting surface is attached to, and forms part of, a framed structure or girder. This girder is analogous to a girder bridge, whose own weight is unimportant in comparison with a dead load at the centre of the span. As the weight of the wing itself is supported by the distributed pressure of the wings, no matter how heavy the wings become, and how small the central load, the actual weight of the wing frame itself does not add to the stresses in its members. Taking into account the special conditions of loading, the established methods of calculating stresses in framed structures are immediately applicable.

It is known that in steady flight the root of the wing surface is more heavily loaded than the tip, and that the upper surface is more heavily loaded than the lower. What conventional loading are we to assume?

The whole question of local stresses in gusts is practically untouched. Again, we have combined compression and buckling in wing spars. Owing to the special form of loading and bracing the fibre stresses from these superposed forces and moments may be approximately equal.

The usual method of analysing these stresses at present is to break up the actual frame into a fictitious pin-joint frame, whose joints coincide with the points of attachment of stanchions and main spars. To these pin-joints a fictitious continuous beam is supposed to be linked by vertical links; and to this fictitious beam is applied the loading. In each continuous member the bending moments, points of inflexion and reactions at pin-joints are calculated by the theorem of three moments, usually on the assumption that the points of support are level under all loads, and the reactions vertical. The reactions so calculated are applied to the pin-joint frame and give compressions and tensions from the ordinary stress diagram for pin-joint frames. The stresses and bending moments so obtained are then superposed and each member is calculated for combined compression and buckling, the free length being taken as the distance between points of inflexion.

Many far-reaching assumptions underlie this method, all of which are approximate, and some of which may be very poor approximations indeed. Some obvious queries arise. Are the points of inflexion unaltered when end thrust or end tension is superposed on lateral load? What is the general nature of the movement of the points of support out of the straight line joining the two end points?

Another type of frame is rendered possible by the use of steel tube and rigid welded sockets for both spars and stanchions. As the whole frame is rigid, warping is impossible and *ailerons* must be used. So far as the writer knows, no solution of the stresses in this latter frame is available, though it is obviously stronger than a similar frame with pin-joints between the stanchions and the main spars.

To close this section, it is clear that the efforts of designers to lighten frame works have already reduced the weight of the glider for the load it has to carry.

The Coefficient of Glider Weight.—The writer has already, in the *Journal*, defined a coefficient of glider weight, and has pointed out its importance in determining the maximum useful load that can be lifted or the maximum speed that can be attained with a given useful load. A good empirical equation for the lower limit of this coefficient to which the best efforts of structural design are tending, is an absolute necessity if general questions of limiting size, speed, useful weight, and desirable horse-power are to be answered accurately.

The Coefficient of Power Plant Weight.—Another coefficient,

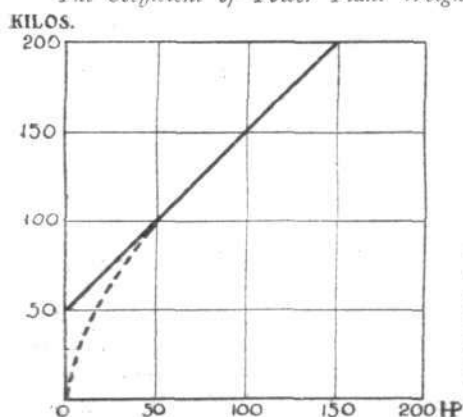


Fig. 2.

closely connected with the coefficient of glider weight, is the coefficient of power plant weight, " k_1 ," which is defined conveniently as the weight of all items which vary with the horse-power. It is a fair approximation to take a residual constant weight of about fifty kilograms for all horse-powers from 50 upwards, and to represent the additional total weight by the straight line diagram shown in Fig. 2 for the bare motor.

This diagram gives $k_1 = [(50 + x) + 1]$ kilograms, where $x = h.p.$ To this must be added the fuel weight, which is the weight consumed per hour per horse-power multiplied by the horse-power hours of the flight, and the same for cooling water. Further, an allowance must be made for tankage and radiators, say from 10 per cent. to 15 per cent. of fuel and water weights. Further elaborations of the values of k_1 cannot be indulged in here. It should be stated, however, as a matter of common knowledge, that air cooled motors are lighter than water cooled motors per horse-power, but that the consumption of petrol and lubricating oil is greater. The result is that if power plant weight per horse-power be plotted against hours flight, the straight line of weight for an air cooled motor will in general start much lower for very short flights, and will rise faster, crossing the water cooled line at somewhere between five and fifteen hours' duration.

These figures are only rough and require further very careful discussion by experienced and competent engineers. If, however, we assume that k_1 and k_2 are known, the former as the simple function of the horse-power x and time t , $k_1 = [(C_1 + x) + C_2 + C_3 t]$ where C_1 , C_2 , C_3 are nearly constant coefficients drawn from experience, and if the aerodynamical coefficients k_x , k_y are reasonably represented by the empirical formulae already given we are in a position to investigate the whole range of possible design for any power, useful load, surface, velocity, and range of speed in a quite general manner.

Stability.—No mention has yet been made of stability, and till this point it has been assumed that every machine is stable, or at least controllable. To discuss the problems raised in seeking stability, it is necessary to commence with the possibility of equilibrium in flight, for which only the position of the centre of gravity and the reactions on the planes should be known. If, however, any agency sets up oscillations, the whole question of dynamical stability is raised, involving the moments of inertia of the machine A , B , C , the products of inertia, if they exist, D , E , F , about the axes of rotation.

We require to know not only the coefficient of lift and drag for various incidences, but the coefficients of the rotary derivatives, $k_{\dot{x}}$, $k_{\dot{y}}$, $k_{\dot{z}}$, &c.—to extend Bryan's notation slightly—quantities whose experimental determination has not yet been published. From these, as we know, Professor Bryan has derived his special forms of Routh's discriminant functions $A B C D E F$. And Mr. Bairstow has recently shown this society models whose $A B C D E F$ were small negative quantities, and which had corresponding types of instability.

The systematic determination of stability coefficients can at present be undertaken by technical engineers of high competence and reliability. Yet it will not be long before every specification inviting tenders will require the results of stability calculations to be embodied in the tender, and he believed that at least two European Powers have inserted this requirement. The same is already true of nearly every other quantity referred to in this paper.

The object of this paper is achieved if it has brought emphatically to the notice of those interested in aviation what a formidable series of special developments of engineering science must be carried out before it will be possible to say in the design room, "These figures and these drawings will, if translated into wood and canvas, steel and brass, produce an aeroplane whose performance and air-worthy qualities will be thus and thus." That nation will take the lead whose scientists, and whose technical engineers, and whose works engineers, and whose pilots best understand each other and work together most cordially.

In the subsequent discussion, Dr. Thurston pointed out the importance of working from sound aerodynamical theory and how attempts to cut down weight often had the effect of increasing the head resistance. Mr. Bramwell said that the author of the paper, when he stated that the weight of wings was unimportant, was referring to steady flight, but accelerations from any cause render weight an important factor. At the N.P.L. they had achieved a considerable degree of accuracy in their measurements—the error not exceeding one half per cent.—and the smaller the model, the better. This error did not represent the actual value when applied to the full-sized aeroplane, as it would be necessary to make the scale correction. Mr. Green said that they had to start their design from consideration of the landing speed.

The Chairman (Mr. Mervyn O'Gorman), observed that the paper was full of suggestion, and advocated the setting up of experimental tunnels by aeronautical constructors, for while these were quite inexpensive, there were so many problems to be solved and investigations to be made, that they would amply repay the manufacturer.

Mr. Low, in the course of his reply, stated that his paper had not been so complete as he would have liked, owing to circumstances over which he had no control, but his purpose would have been served if it resulted in greater co-operation between engineers engaged in research and those employed in the design of aeroplanes.

THE CEDRIC LEE MONOPLANE.

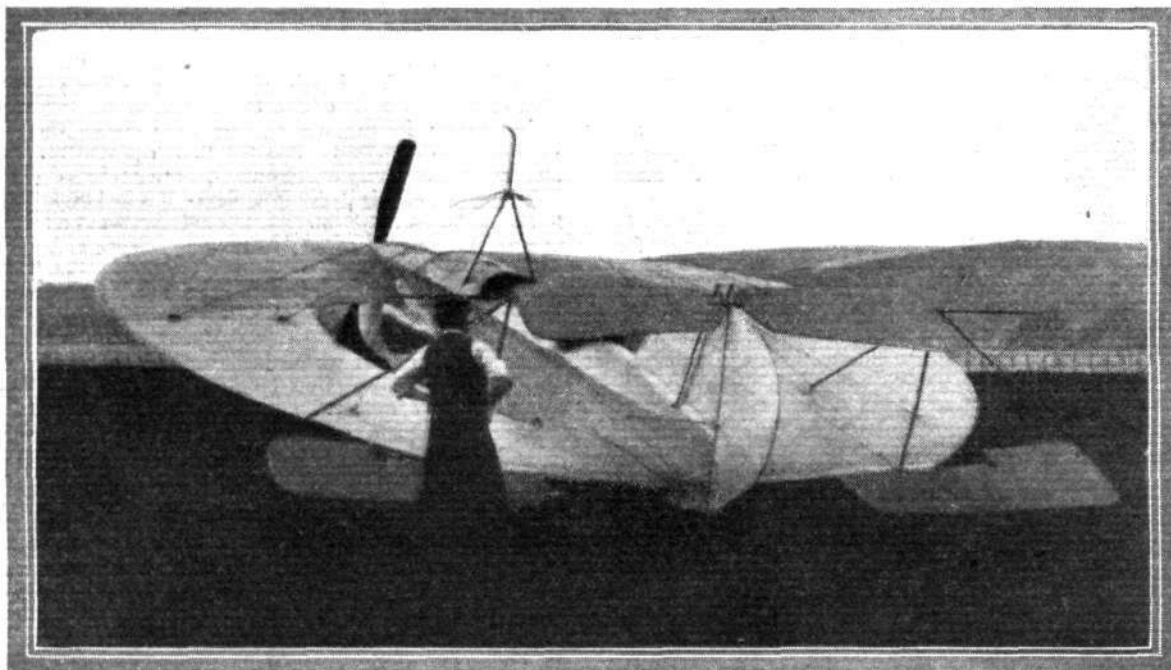
As in the early days of the Dunne machine, considerable mystery enshrouds the Cedric Lee monoplane, practical experiments with which have been carried out at the Shoreham aerodrome for some months past. Not the least point of interest in connection with the Cedric Lee monoplane is that it is more or less at variance with certain aerodynamical theories as accepted to-day. Unfortunately, detailed particulars of this interesting machine cannot at present be placed before our readers, as the Cedric Lee Co. do not yet wish these to be made public. Since, however, several successful flights have been made in public, and as entries have been made for the coming Gordon-Bennett race, the following brief particulars, together with the accompanying illustrations, should be of special interest. The most important feature of this machine is that it flies "pterygoid," that is, like a dart, or its length is greater than its span. The latter, in fact, is only some 20 ft. The planes are annular in plan form, being centrally divided fore and aft by the *fuselage*. The whole of the plane section in side elevation forms one large camber, but the front portion of the plane is also cambered. The covered-in *fuselage* is rectangular in section, tapering to a vertical knife-edge at the rear. In the middle of the *fuselage*, in the "hole" of the plane, are the passenger's and pilot's seats, the former occupying the front one, where an excellent view below can be obtained. The engine, a 50 h.p. Gnome, which drives a tractor screw, is placed inside the *fuselage* in front of the passenger's seat, air scoops being fitted in the sides of the *fuselage* for cooling. Hinged to the rear extremity of the plane are two elevators, whilst two others are mounted above them, one on each side of the vertical rudder, which is hinged to the

but the machine only rolled a little way on the outer edge of the plane and then settled down on its chassis



The Cedric Lee machine in flight.

again without any ill effects. Mr. Gordon England has made several flights on this machine, and just recently



The Cedric Lee machine.

rear end of the *fuselage* and to a vertical fin mounted on to top of the latter. A strong three-wheeled chassis is fitted, one wheel being right in front to protect the propeller. It is claimed that this particular model has a speed range of from 45 m.p.h. to well over 70 m.p.h. Strong construction is another of its features; on one occasion a landing was made on one of the "wing tips,"

Gordon Bell has joined the Cedric Lee Co., and has also made several flights. Unfortunately he met last week-end with one of those accidents that must always be associated with valuable experimental work, so that activities will be delayed for the present, but we understand that the two machines for the Gordon-Bennett are well in hand at the works.

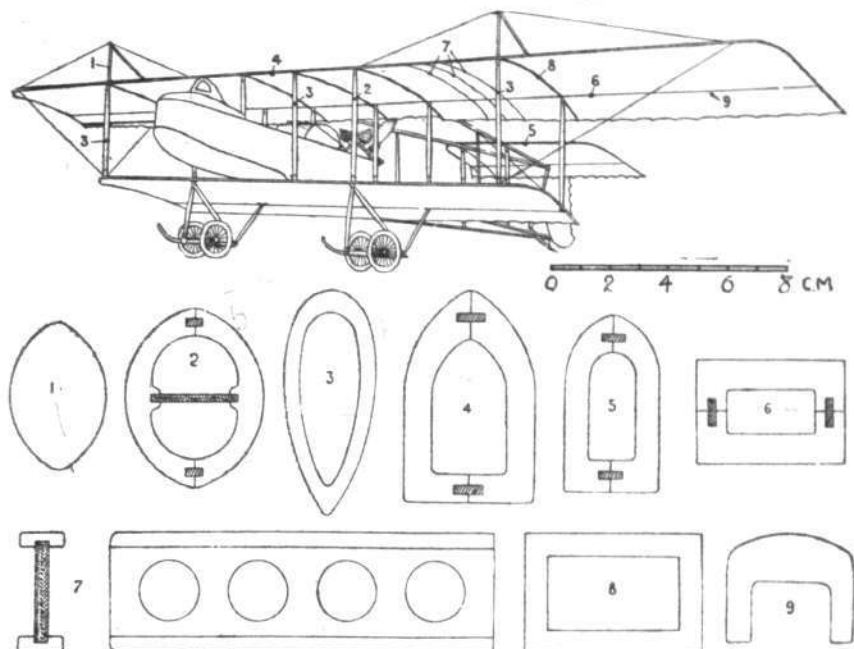
HOLLOW WOOD IN AEROPLANE CONSTRUCTION.

SOME time ago, it will be remembered, we published an article on "An Aeroplane in the Making." As an example of modern practice in aeroplane construction, we described the procedure followed by the Sopwith Aviation Co., of Kingston. This week we supplement

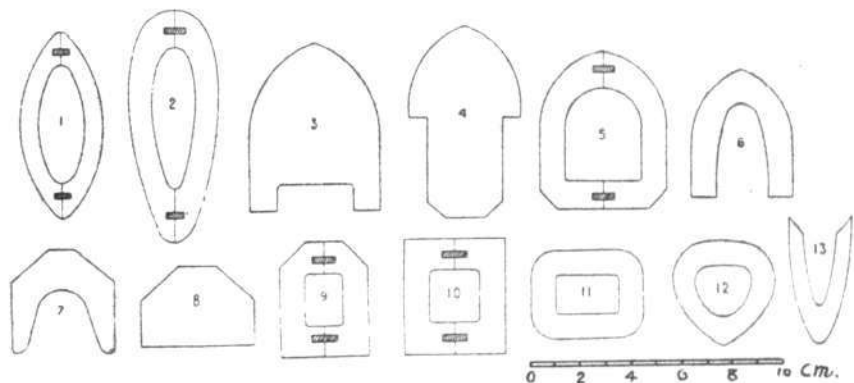
badly adjusted. Below is described the method of construction employed by Farman, Doutre, Lioré, &c.

"The members are made in two symmetrical pieces, joined together by two glued strips running throughout their entire length. The member thus formed does not offer a very great resistance to bending strains and especially to compression strains, under the effect of which the two component parts have a tendency to come apart. In order to remedy this, the member is bound with glued fabric, a finish which makes it stronger than if it had been made in a single piece.

"The binding is carried out in two different ways, according to whether the member is of constant section or of varying and rounded section. In the first case the member after being hollowed out and glued, is bound throughout its length with a spiral of glued fabric, each winding slightly overlapping the preceding one. In the second case it would be very difficult to make the fabric conform to the rounded outline of the strut, and unevenness and wrinkles would result. This difficulty is overcome by using strips of fabric cut on the bias and by sandpapering the fabric when it is dry. This method is used by some constructors, but it is more generally preferred to make annular bindings with certain intervals, which have the same effect as the continuous band, require less fabric and glue, and are easier to make. The material used for binding is either whipcord or strong fabric.



Sections of the H. Farman parts with reference numbers corresponding to figures on diagrammatic sketch.

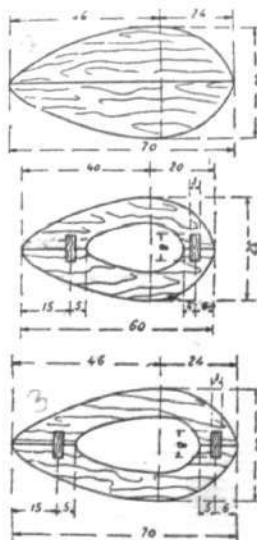
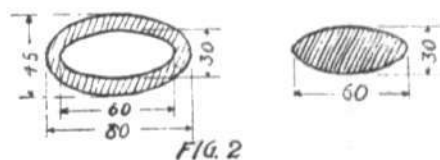
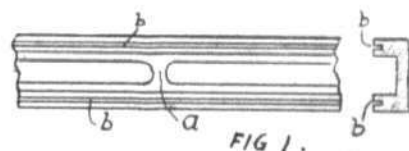


Sections of M. Farman parts.

our description by an abridged translation of an article by M. P. James, in *L'Aerophile* of the 15th ult., in which he describes the procedure followed by Farman Brothers and others in hollowing out the various members of their machines.

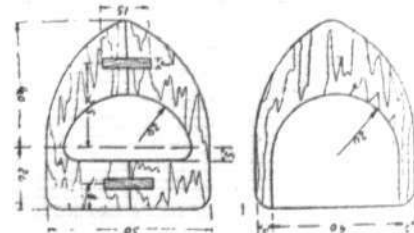
"The methods of aeroplane construction, both with regard to wood and steel, have advanced immensely since the days of the box kite, and the increased loads carried have produced an increase in the dimensions and strength of the machine. In order to meet the new requirements without attaining too heavy a dead weight, stronger and lighter framework was found to be necessary, and while some constructors turned their attention to steel others decided to utilize hollow wood.

"Those who used wood construction frequently employed I sections for spars and ribs, whilst the struts were of streamline section; but all these members had a great disadvantage. Being made out of a single piece of wood they lost their shape under the influence of moisture in the air, and machines which were left in the hangars, especially during the winter months, became



Sections of Doutre biplane wing spars.

"The rectangular pieces from which the members are made are first spindled out to a hollow section. Care is taken to leave at certain intervals solid parts, as in *a*, Fig. 1, and grooves are hollowed out for the strips *b*. Especially in the struts it is usual to leave solid places where the bindings are to come:

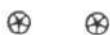


Sections of Doutre biplane struts.

"The two pieces are then glued with the wooden strips in place, and dried under pressure. A member manufactured in this manner is hollow internally, whilst externally it is rectangular. Next the outside is machined down as if it were a solid piece of wood. If it is a *longeron*, the sides are cut to a suitable angle; if it is a strut, the outline is rounded off to the desired section, and finally the member is bound with fabric in one of the two ways described above.

"The increase in stiffness obtained by using hollow wood permits the use of spruce instead of ash. This wood has an advantage over hard wood in that weight for weight it can be given a greater cross-section, and it is well known that in wood construction a greater bulk should be employed than that arrived at by calculation, for the wood, not being homogeneous, cannot without danger be employed below certain sections.

"Our illustrations show some sections of the H. Farman machine, with an indication of the members to which they correspond. Special attention is drawn to the ribs and struts, which have webs of three-ply wood that are par-



WIRELESS TELEGRAPHY.

A PAPER of considerable value to all who are interested in the subject of Wireless Telegraphy was read by Mr. H. Fothergill before the North East Coast Institution of Engineers and Shipbuilders on the 23rd ultimo. At the outset, the author indicated the manner in which electro-magnetic waves were produced and the differences between the damped waves employed in the Marconi and the Telefunken systems and the undamped waves employed by Poulsen and by Goldschmidt. He then explained the operation of

ticularly strong, and absolutely indeformable by moisture. Sections are also given of the Maurice Farman and the Doutre.

"We will now show by an example the increase of resistance obtained, weight for weight, by the use of a hollow strut instead of a solid one. Let us suppose that we have a streamlined strut, Fig. 2, measuring 30 by 60 mm. The sectional area is $\pi \times 15 \times 30$, and the weight is proportional to this area. The resistance would be determined by its modulus of resistance, which is equal to $\frac{\pi}{32} \times 108$. A strut of hollow wood, measuring 80 x 45 and 60 x 35 mm., will have the same sectional surface. Its modulus of resistance will be $\frac{\pi}{32} \times 207$.

If we work out the proportion we find $\frac{207}{108} = 1.9$, so that the resistance of the hollow wood strut is nearly twice as great as that of the solid strut. From this the advantage of this method of construction will be readily appreciated."



the essential features of these four systems of telegraphy, with the assistance of diagrams and photographs showing the arrangement and details of the equipment used at various sending and receiving stations, and concluded by referring to recent developments in wireless telegraphy.

Owing to the already extensive nature of the paper, it was not possible to deal specifically with the application of wireless aircraft, but the paper is one that can be read with profit by all who have a knowledge of this branch of engineering science.

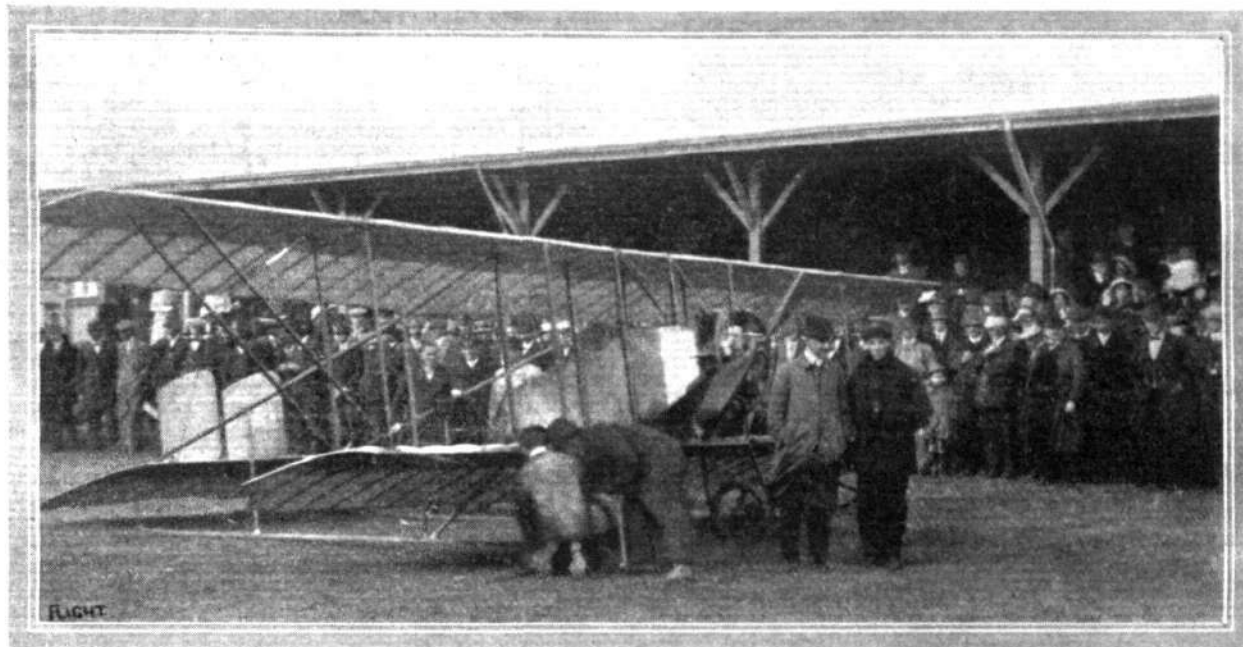


Byfleet, 1,000 ft. up, as seen from the 100 h.p. Sunbeam-engined Maurice Farman, piloted by Mr. J. Alcock.

AVIATION IN NEW ZEALAND.

JUDGING from some details which are to hand from Mr. J. W. H. Scotland, who has been flying a 45 h.p. Anzani-Caudron out there, New Zealand is anything but an aviator's Paradise. In spite of many difficulties, however, Scotland, on March 6th, succeeded in making a splendid flight of about a hundred miles from

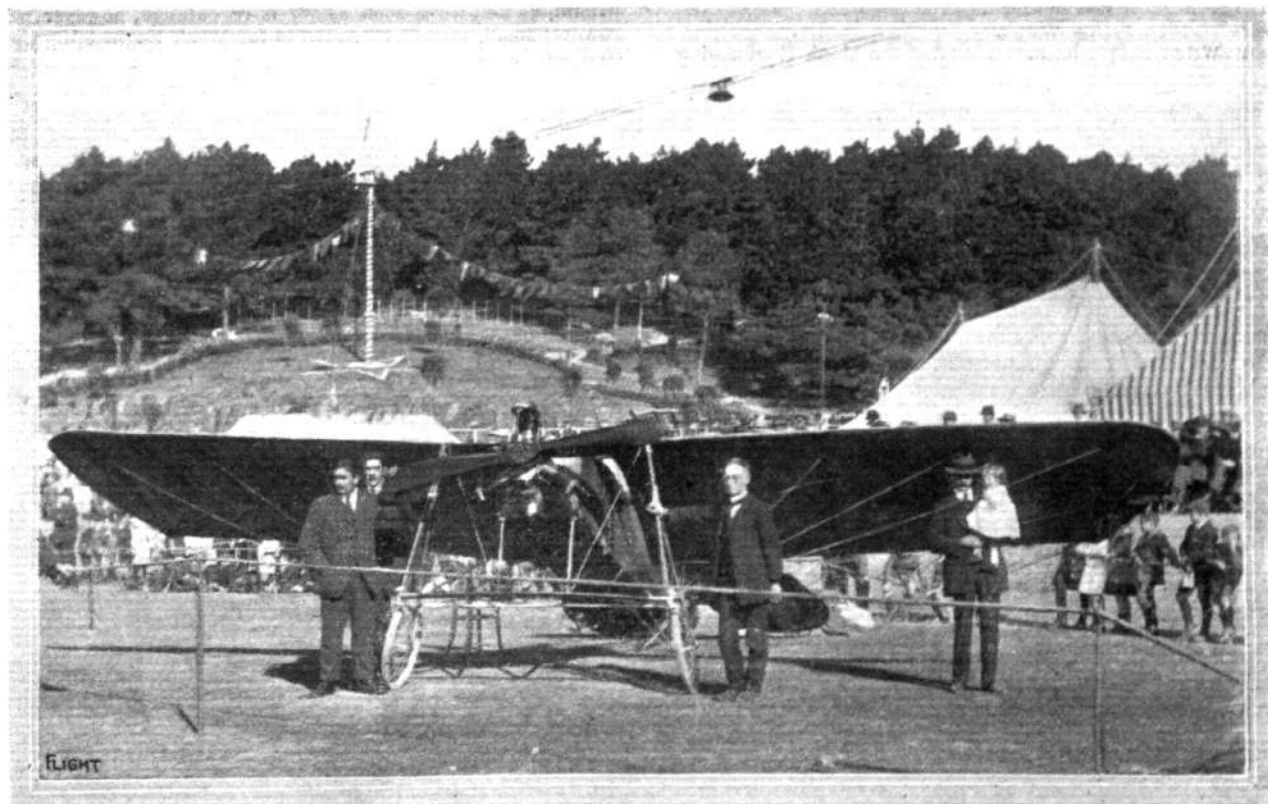
plane, and then, as the conditions were very bumpy, the machine was elevated to 5,000 ft. There was no improvement, however, and Scotland decided to come down at Orari, where several adjustments were made to the machine, and it was not until 3.20 that the re-start was made. Then owing to the gusty wind Scotland went up to



Mr. Scotland, the New Zealand aviator who has been making such good headway in introducing flying at the Antipodes, with his 45 h.p. Anzani-Caudron at Athletic Park, Wellington, on March 21st.

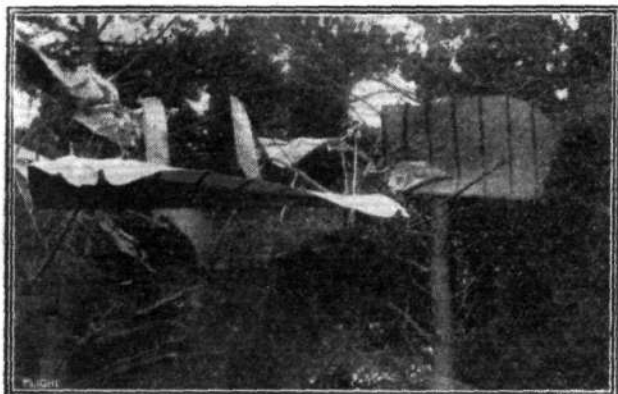
Timaru, South Canterbury, to Christchurch. After a preliminary flight at 6.30 a.m. at Timaru, Scotland effected a few adjustments and got away on his journey at half-past eight, the machine quickly rising to a height of 2,500 feet. When passing over Temuka a parcel was delivered by being dropped from the aero-

6,000 ft. Finding no improvement he came down to an altitude of about a thousand feet, where the atmosphere was calmest. He reached Christchurch at 5 o'clock, and after circling round the town made a fine landing at Addington. During the journey both the Caudron biplane and the Anzani engine performed



Mr. A. W. Schael's 35 h.p. Y Anzani monoplane (built by himself) at Newton Park (New Zealand) Aviation Meeting on March 24th. This machine, it will be remembered by our readers, was shown in flight in these pages some months ago.

splendidly in spite of having to fight their way through most trying conditions. Interviewed after the flight, Mr. Scotland said that if he had not been mounted on such an excellent combination, he would have come to grief several times, as the wind from the hills seemed to form funnels and whirlpools which tossed the



Mr. Scotland's machine in the trees after his mishap at Newton Park, N.Z., on March 24th.

little Caudron about like a cork on the sea. On March 21st Scotland was at Wellington, and arranged to give an exhibition at the Athletic Park. The weather, however, was too bad, and the crowd which assembled were given tickets for the following Tuesday. On Sunday and Monday the weather was comparatively calm, but in view of the arrangement made with the ticket holders Scotland was asked not to go up. On Tuesday the weather



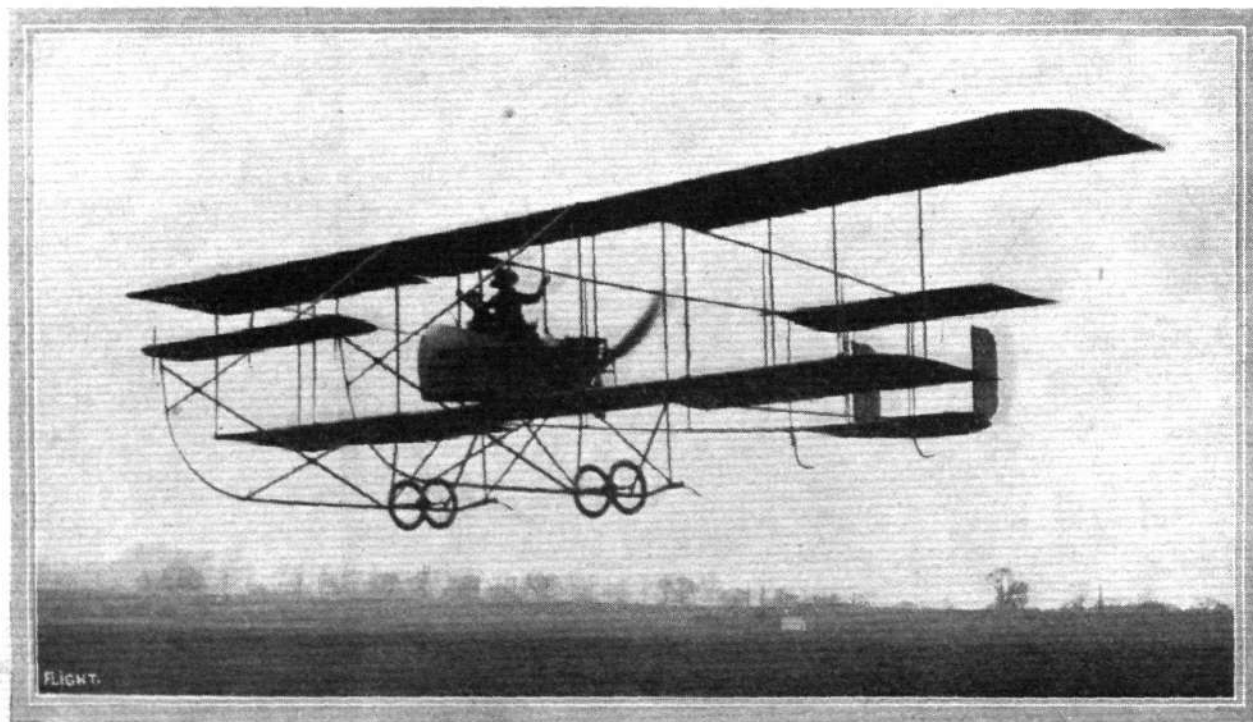
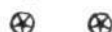
Flying at Shoreham.

MR. CECIL PASHLEY and Mr. Elliott contributed a good deal of flying during the week-end on their respective Farmans, and quite a good crowd of people witnessed the exhibitions. Many passengers were taken. On Sunday morning the Cedric Lee circleplane was out under Gordon Bell's pilotage, but unfortunately an accident marred the experiments. The machine was flying about 100 ft. up, when an eye bolt came out of one of the elevators, the machine partly side-slipping and diving. Gordon Bell was cut about and the machine was smashed.

For Special Engineering Work.

A SOMEWHAT unique business is that of the Monk Engineering

Co., Ltd., of High Street, Coventry, for the firm makes a speciality of special engineering work, such as the building of experimental engines or the replacement of broken parts, &c., and, by reason of their experience and the facilities which they have, are in a position to carry out such work at a reasonable cost and in a minimum time. The firm is noted for the extreme accuracy of its workmanship, and also for the high quality of the materials employed. Although it is impossible to give names, it may be stated that the clientele of the firm include some of the leading engineering concerns in Great Britain, so that work such as we have outlined, however large or however small, may be entrusted to the Monk Engineering Co. with confidence.



Mr. Noel, at Hendon, flying on the Maurice Farman with Miss Kitty Kent, who is so prominent in "The Girl from Utah."

BRITISH NOTES OF THE WEEK.

ROYAL FLYING CORPS.

THE following appointment was announced in the *London Gazette* of the 24th ult. :—

R.F.C.—Military Wing.—Capt. Frederick St. G. Tucker, Worcestershire Regiment, from a Flying Officer, is appointed to the Reserve. April 13th, 1914.

The following appointments were announced by the Admiralty on the 24th ult. :—

Sub-Lieut. G. R. Bromet to the "Pembroke," additional, for course at Central Flying School, May 12th. Engineer-Lieut. H. M. Cave-Browne-Cave to the "Pembroke," additional, for the Isle of Grain Naval Air Station, April 23rd. Artificer Engineer H. Dearman to the "Pembroke," additional, for the Farnborough Naval Air Station, April 23rd.

Royal Naval Reserve.—F. M. Lill Barr, H. G. Wanklyn, J. M. R. Cripps, B. F. Bainsmith, and L. B. Hay have been appointed to the "Pembroke," additional, as Probationary Sub-Lieutenants, for course of instruction at the Central Flying School. To date May 12th.

The following appointments were announced by the Admiralty on the 10th ult. :—

Lieut. A. Gaskell, lent to the Central Flying School as Assistant Instructor. To date May 6th. Sub-Lieut. R. Peirse, R.N.R., lent to the Central Flying School as Assistant Instructor. To date May 6th.

Looping at Farnborough.

AT Farnborough, on Wednesday, Mr. G. Pratt, one of the pilots at the Royal Aircraft Factory, made two loops on a B.E. biplane, and a similar flight was subsequently made by Lieut. G. de Havilland, also on a B.E.

The Navy's "Parseval" over London.

A BRIEF visit was made to the Metropolis by the Airship No. 4 (Parseval) on Monday afternoon. After circling round St. Paul's Cathedral a course was set for the Crystal Palace, from whence after rounding the North Tower the vessel returned to Farnborough.

Mr. Churchill's Seaplane Trips.

ON Friday of last week, the First Lord of the Admiralty, Mr. Winston Churchill, started from the Isle of Grain Naval Air Station on a seaplane piloted by Com. Seddon on a trip to Harwich. When the machine was off Clacton, however, engine trouble developed, and after coming down the machine was taxied on to the beach. In response to a message another seaplane was flown over to Clacton and took Mr. Churchill on to Harwich.

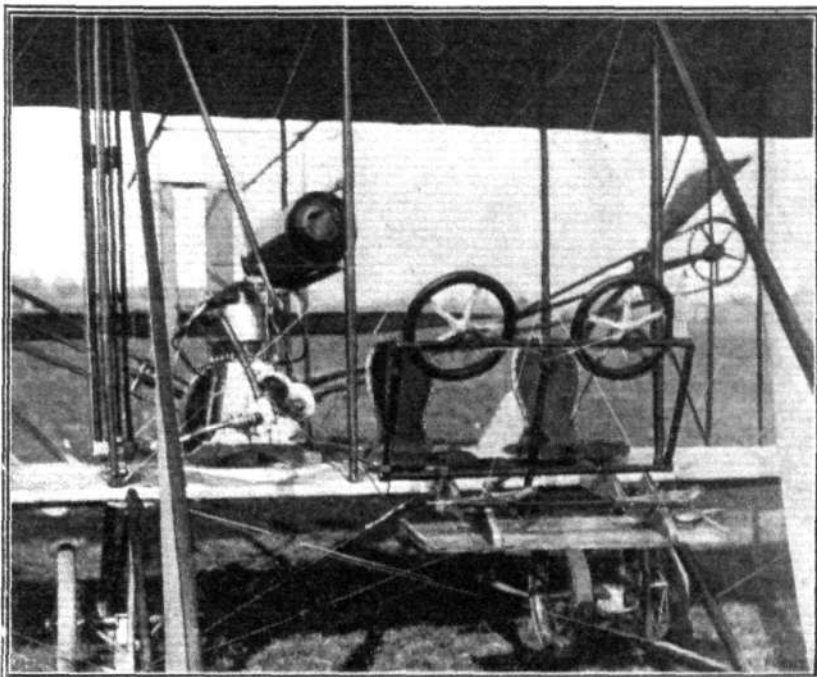
The Aerial Derby.

ARRANGEMENTS are well in hand for the third Annual Aerial Derby Race, which will be held on Saturday, May 23rd, 1914. The race will be held over the same 95 miles circuit as last year, the start and finish being at Hendon with turning points at Kempton Park, Epsom, West Thurrock, Epping, Hertford. For the fastest

time there is the *Daily Mail* Gold Cup and a cash prize of £200 presented by the distributors of Shell Motor Spirit, while there will be a sealed handicap in which the prizes will be Shell Trophy and £100, £75, and £25, all presented by the distributors of Shell Spirit.

The Desoutter Fund.

FROM Mr. Bernard Isaac, the hon. sec., we learn that the



The dual control and power plant of the Wright flyer at the Beatty School, Hendon Aerodrome.

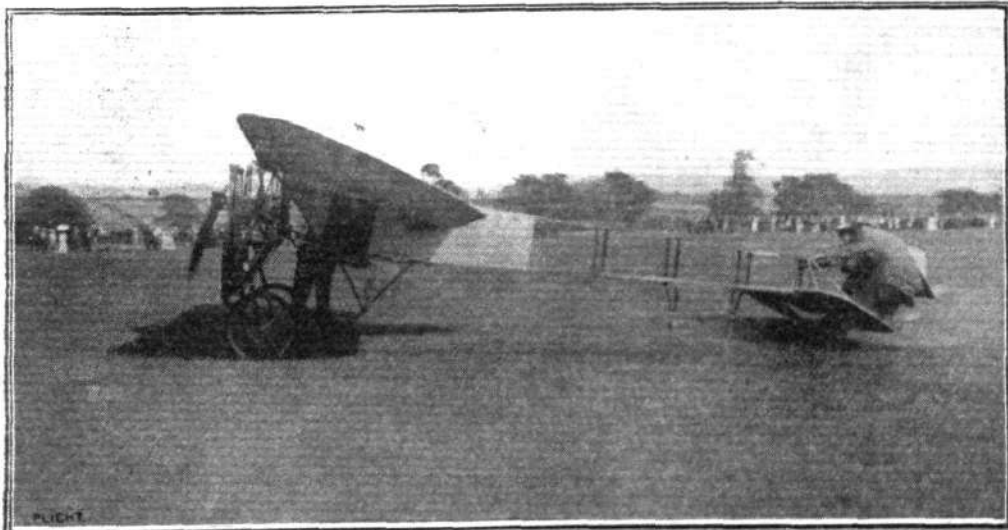
Desoutter Benefit Fund now amounts to £119 7s. 9d. Owing to the rain, the attendance at the Desoutter Meeting at Hendon on March 19th was not so large as had been anticipated, and the gate receipts, which were given to the fund, were only a little over £100. It is hoped, therefore, that visitors to the aerodrome will support the fund as much as possible, and any donations, however small, will be gratefully received by the honorary treasurer, Mr. T. K. Walton, the London Aerodrome, London, N.W.

Flying in South Wales.

ON Monday, of last week, Mr. H. H. James, one of the James Brothers, made a trial flight of 20 mins. duration, at Narberth in South Wales, on a 45 h.p. Anzani-Caudron type biplane, which is said to be the first aeroplane to be built in Wales. The following evening J. H. and H. H. James each made cross-country flights of half an hour. The next day, I. H. James was out for a high flight, reaching 3,000 ft., but only remained aloft about 20 mins., as the air was choppy.

Mr. B. C. Hucks at Bradford.

AFTER his memorable flight across the Channel on Tuesday of last week, Mr. Hucks' machine was packed up at Hendon and on the following day at Bradford he commenced a demonstration of fancy flying on it at 3 p.m. There was a lot of wind, but Mr. Hucks was able to do some of his vertical banks. When starting on his second flight with this machine, one of the hangers-on fouled the tail plane, straining it slightly, and making it unsafe for passenger work. On the 50 h.p. looper Mr. Hucks accomplished nine loops and remained upside down for over a minute. The Lord Mayor and Lady Mayoress of Bradford were present, and had



Mr. S. Summerfield about to start on a flight at Melton Mowbray on his Blériot. Note the little mascot cat above the wings.

an interesting trip with Mr. Hucks. On Thursday, Friday and Saturday Mr. Hucks again demonstrated at Bradford. On Thursday he reached an altitude of 4,500 feet and circled Bradford on the "eighty," and on the other machine he made six loops. The weather was appalling on Friday, the wind gusts averaging 45 miles an hour, but Mr. Hucks succeeded in making two loops, and also flew the two-seater, but no passengers could be carried. On Saturday a tremendous crowd turned up, and in glorious weather witnessed a wonderful afternoon's flying. Mr. Hucks carried two passengers and looped the loop five times.

A Pilot's Portrait.

WITH reference to the photograph of Sub-Lieutenant J. C. Spencer-Warwick, R.N.V.R., which appeared in our issue of April 11th, we are asked to make it clear that this gentleman actually secured his *brevet* on Feb. 26th, at the Vickers' School at Brooklands.



"Flight" Copyright.

The Palmer aero wheel and tyre bearing a lateral load of 2,000 lbs.

The Palmer Aero Tyre and Wheel.

SOME little time back we gave a description of the tyres and wheels specially designed for aero work by the Palmer Tyre, Ltd., of 119, 121 and 123, Shaftesbury Avenue, London, W.C., and we drew attention to the remarkable manner in which severe side strains and shocks were successfully contended with by means of the special method of construction of both tyre and wheel. In the accompanying illustration will be found a graphic demonstration of how these wheels and tyres withstand lateral strains. The wheel is inclined at an angle of about 70° whilst it is bearing a downward load of 2,000 lbs. or nearly one ton, and yet it will be seen that the tyre is still secure in the rim. The total weight of the wheel and tyre is only 13 lbs.

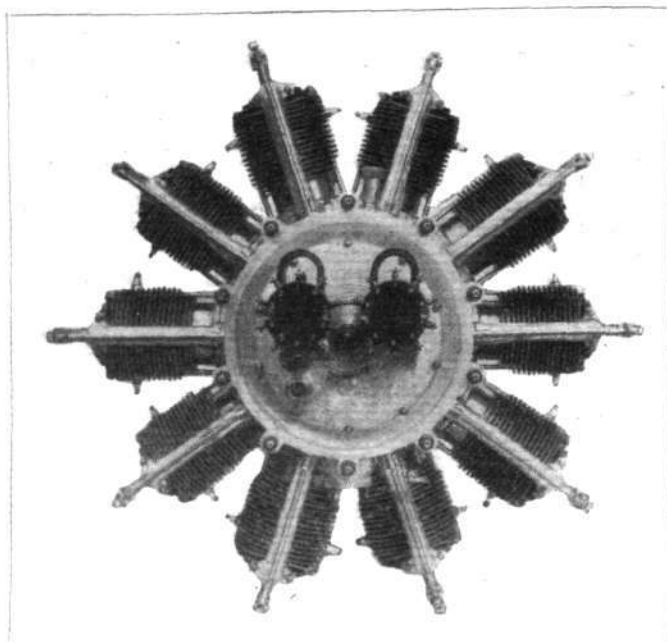
Looping in Australia.

THE exhibition tour of Maurice Guillaux opened at Sydney, N.S.W. on the 20th ult., when he looped the loop, &c., on his Blériot. This being the first time that the feat had been accomplished in Australia it naturally aroused a good deal of enthusiasm, more especially as it followed on the revival of interest in aviation following on the fine display of flying recently given by Hawker on the Sopwith machine. On Monday last Guillaux made similar exhibition flights at Newcastle, N.S.W.

The G.A.C. in Australia.

FROM time to time we have recorded the extraordinary way in which the business of the General Aviation Contractors, Ltd., is spreading itself all over the world. We now learn that Mr. A. Delfosse Badgery has been appointed agent for Australia for the various G.A.C. Specialities, Anzani engines, Emaillite dope, &c. It may be recalled that Mr. Badgery was recently in this country, and in the early part of January qualified for his R.A.C. certificate on a 35 h.p. Anzani-Caudron biplane at Hendon.

It is Mr. Badgery's intention to actively engage himself in his country with the aviation industry. He arrived in Australia two weeks ago, and has commenced to construct a biplane of his own



A rear view of the 125 h.p. 10-cylinder engine, British-built Anzani, to which reference was made on page 448 in our issue of last week. Previous to being sent to Farnborough for the Naval and Military Aeroplane Engine Competition, the engine made a non-stop of eleven hours at Coventry, running in a highly satisfactory manner and keeping remarkably cool the whole time, although only subjected to the test of the draught propeller. For the British engines, of which this is the first, Bosch magnetos with K.L.G. plugs have been adopted, and in the above model two magnetos are fitted.

design, for which he has just ordered a 1914 45 h.p. 6-cyl. Anzani engine, "Rapid" propellers, "Gnomol" castor oil, "Emaillite" dope, &c.

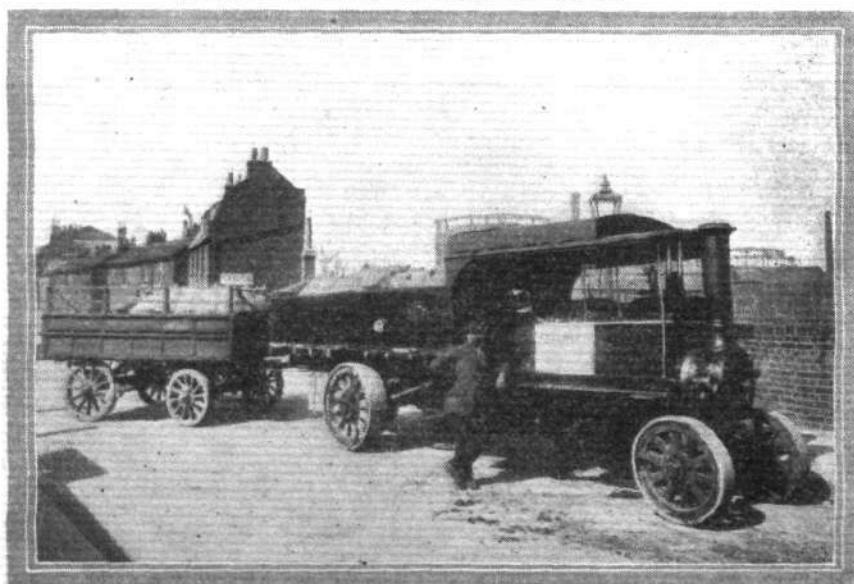
If the first machine is successful, Mr. Badgery proposes to build three or four more larger machines, designed to take the 60-65 h.p. 10-cyl. Anzani engine and the 80 or the 100 h.p. 10-cyl. types.

The Handley Page Biplane.

SOME good trial flights on the Handley Page biplane, which is fitted with a 100 h.p. Anzani motor, were made at Hendon on Wednesday by Mr. Rowland Ding, who only qualified for his ticket on Monday last at the Beatty school. During his first flight of about a quarter of an hour, Mr. Ding took the machine up to 2,500 feet and found it remarkably stable, while we understand that the speed was about 70 miles an hour.

Cellon on the Sopwith Waterplane.

IT is interesting to note that the Sopwith waterplane which won the Schneider Cup at the Monaco meeting, attaining a speed of 140 kilometres per hour, was doped with Cellon.



A consignment of Cellon dope leaving the Cellon works for delivery to the War Office, being a portion of the last batch ordered.

FOREIGN AIRCRAFT NEWS.

More Records Secured by Garaix.

ON the three-seater Paul Schmitt biplane, fitted with 150 h.p. Gnome motor and Integral propeller at Chartres on the 22nd ult., Garaix established a number of new records for pilot and six passengers and incidentally beat the existing records for two, three and four passengers. The new speed records are:

Distance.	Time.	Distance.	Time.	Distance.	Time.
	m. s.		m. s.		m. s.
10 kils. ...	5 35	30 kils. ...	16 48 $\frac{1}{2}$	50 kils. ...	28 5 $\frac{1}{2}$
20 " " ...	11 12 $\frac{1}{2}$	40 " " ...	22 28 $\frac{1}{2}$	100 " " ...	56 44

In addition, Garaix made the following time records; $\frac{1}{2}$ hour, 50 kiloms.; 1 hr., 104.141 kiloms.; greatest speed, 107,462 k.p.h.; duration, 1 hr. 2 mins. 25 $\frac{1}{2}$ secs.; distance, 110 kiloms.

Duration Record Regained by France.

ON a 60 h.p. Rhone-Caudron, Poulet on the 27th ult., succeeded in regaining the world's duration record for France. With his machine carrying 425 litres of fuel and 80 litres of oil he started from Etampes at 5.8 a.m., and flew over a course from Etampes to Arthenay and back. Twelve rounds of this 72 kilom. course were made, and then, as it was getting dark, Poulet continued to fly over a circuit of 10.4 kiloms. at Etampes. Seven rounds of this were covered before Poulet descended, after well beating Langer's world's record of 14 hrs. 7 mins. His time in the air was 16 hrs. 28 mins. 56 $\frac{1}{2}$ secs., while the distance covered was 936.8 kiloms.

An Italian Height Record.

IN the course of a flight lasting 2 hours 20 mins. on a Farman biplane, Lieut. Salomone beat the Italian height record by going up to 4,700 metres.

The Schicht Prize.

DURING last week the competition for the Schicht prize of £5,000, one of the most important contests yet held in Austria, was decided. The course was a round trip of 700 kiloms. from Vienna to Prague, Teplitz and Brunn, returning to Vienna, followed by a trip to Budapest and back, representing an additional 500 miles, and this had to be completed by Sunday last. Six machines started from the Aspern Aerodrome on Sunday week, including two Etrich monoplanes and four Lohners. The competition was marred by the fatal accident to Pitschmann on the 24th, which is recorded elsewhere, when making a belated start for the first stage. The winner eventually proved to be Viktor Wittmann who was flying a Lohner monoplane fitted with a 90 h.p. Austro-Daimler engine.

Flying Over the Jungfrau.

A SECOND flight over the Jungfrau, which is 4,167 metres high, was made by Oscar Bider on the 22nd ult. This time he used a Morane-Saulnier monoplane, and starting from Berne at 5.40 a.m., he landed at 7.18 at Brigue, just by the spot from which Chavez and Bielovucic started on their flights over the Simplon.

Buc to Mourmelon on a Voisin.

ON a Rhone-engined Voisin biplane, Rugere on the 23rd ult. flew from Buc to Mourmelon, the machine making a good passage in spite of having to fight its way against a strong wind.

High Flying on a Waterplane.

DURING a flight which lasted 1 hr. 19 mins. at Monaco on the 22nd ult., Burri on the F.B.A. flying boat attained a height of 2,300 metres, which it is claimed is a height record for hydro-aeroplanes.

Some New Loopers.

AT the Blériot school at Buc on the 21st ult., looping was carried out by a Russian pupil, Alexandre Raewski, as well as by Maccavei, a pupil hailing from Roumania. At the Morane school another Russian, Eugene Spilzberg, succeeded in looping the loop last week.

Looping on a Farman.

DURING a series of exhibition flights at Yvetot on the 21st ult., Poiree, on his Henry Farman, looped the loop and flew upside down with a passenger. He also looped the loop with a lady passenger.

Combined Manoeuvres in France.

ON Monday of last week an important series of manoeuvres, in which aeroplanes, infantry, cavalry and artillery are taking part, commenced at Belfort. Although it is practically impossible to get any information as to the operations, it is stated that they are being carried out with a view to obtaining data as to the way in which aerial tactics affect strategy.

A Busy Day on a Farman.

FROM Epinal on the 24th ult. Sergeant Quennehen on his Maurice Farman flew to Chalons-sur-Saone and back, to Nancy and

back, to Rambervilliers and back, and to Mirecourt and back. Altogether he covered a distance of 650 kiloms. in 9 hrs. 20 mins.

An Aerial "Pique-Nique."

FOR the end of this month the French Aviators' Friendly Society is arranging a meeting for its members, which, it is proposed, shall take the form of a "pique-nique" in the neighbourhood of Paris.

French Flying Officer for Turkey.

IT is stated that Capt. Joseph de Goys de Mereyac, who was secretary to General Hirschauer, and is now in command of an escadrille at Chalais-Meudon has been selected to take charge of the organisation of military aviation in Turkey.

Chevilliard Tests New H. Farman.

HAVING returned to Paris after a long tour in Austria, &c., Chevilliard on the 24th ult., made some tests at Buc with the Henry Farman biplane, with the fuselage placed just under the top plane, which was shown at the last Paris Salon. The machine climbed very rapidly and almost vertically, while Chevilliard demonstrated that it was very well adapted for looping the loop and upside-down flying.

"Beaumont" Leaves the French Navy.

IN order that he may be able to devote more time to the business of the F.B.A.Co., First Lieut. Conneau, better known by his *nom de vol* of "Andre Beaumont," has resigned from the French Navy.

From Paris to Brussels.

ON a Morane-Saulnier monoplane and accompanied by Lieut. Ask, Dr. Teulin on the 25th ult. started from Villacoublay at 4.45 a.m., and at 10.10 landed at the Berchem aerodrome at Brussels. They had made a stop at St. Quentin at 6.50 for petrol, &c., and did not restart till 8.5 a.m. Both pilot and passenger belong to Sweden.

Racing at Buc.

A LARGE crowd assembled at Buc on Sunday afternoon for the meeting which had been arranged for the benefit of the families of those involved in the catastrophe of the previous Sunday. Three events had been arranged: a 3 kil. race for *taxi-pingouins* or school machines, a 5 kilom. race and a handicap over a similar distance. The taxi race was won by Besille, a Blériot pupil, who covered the 3 kil. in 5 mins. In view of the strong wind it was decided to turn the race into speed trials and time each competitor separately. The result was a win for Jupin on a Bathiat-Sanchez, who did the 5 kil. in 3 mins. 39 secs., while Barault on a Blériot was second in 4 mins. 59 secs. The winner flew a very fine race, but the other competitors went a great deal too wide at the pylons. The handicap was won by Cuendet on a Blériot, his time for the 5 kil. being 3 mins. 41 secs., with Barault second. During the afternoon exhibition flights were made by Chevilliard, Bill and Poiree on Farman, Legagneux on a Nieuport, Baron Paspuier, Maccavei and Guinard on Blériots, the Marquis de Larenty Tholozan on his Maurice Farman, &c.

Long Flight on a Farman.

ON a Henry Farman biplane, Lieut. Riquet, accompanied by his mechanic as passenger, arrived at Vienne (Isere) having flown from Verdon, a distance of 450 kiloms.

Aero and Motor Boat Exhibition in Italy.

ORGANISED by the Italian Aeronautical Industry Syndicate, and under the patronage of the Aero Club of Italy, an international aero and motor boat show is to be held at Turin from the 16th to the 24th inst.

Fatalities in Austria, Russia, Italy and Japan.

WHILE making a flight in connection with the Schicht prize on the 24th ult., Pitschmann was killed through the fall of his biplane at Zwettl in Lower Austria, and his brother who was with him as passenger was seriously injured.

The same day two Italian officers, Lieut. Napolis and Lieut. Battagliani were killed at the Mirafiori aerodrome near Turin. Apparently one wing of the machine piloted by the former broke when they were flying at a height of about 200 metres.

It was announced in St. Petersburg on the 22nd that Lieut. Vetchinin and his mechanic had lost their lives in an accident which occurred at Lidy. Apparently the machine when making a steep *vol plané* capsized at a height of 100 metres.

On Sunday, a military pilot, Morris or Monis, met his death at Tokio. His biplane fell from a height of 500 metres and the wreck caught fire.

On Tuesday, a non-commissioned officer of the Austrian Army, named Wally, was killed as the result of a fall at the Wiener Neustadt aerodrome.

First Aid on German Aeroplanes.

FOLLOWING a conference between representatives of the German Army and Navy departments and flying officers it has been decided that all German military aeroplanes are to carry a "First-Aid" outfit which will be arranged in a pocket at the back of the pilot's seat. Messrs. Burroughs Welcome and Co. should be able to assist in this direction.

Flights in Tripoli.

ON the 22nd ult., Lieut. Tappi, who is stationed at Tripoli, set out on his aeroplane at 6.55 a.m., and at 8 o'clock landed at Tarhuna. After a stop of about an hour he started back and, having circled for some time above Gefara, landed at the Tripoli aerodrome, at 10.40 a.m.

The Burgess-Dunne Hydro-aeroplane.

WRITING under date of April 2nd from Boston, Mass., U.S.A., Mr. Charles M. Chapin sends us the following interesting account of the doings of the Burgess-Dunne hydro-aeroplane:—

"The Burgess-Dunne, equipped as a hydro-aeroplane, has made some splendid flights, and has shown a remarkable degree of inherent stability. The writer was taken up for fifteen minutes on Tuesday, and had an excellent opportunity to observe the stability features and ease of control. The pilot, Clifford L. Webster, who taught himself to fly the Dunne, during the entire flight of fifteen minutes did not touch his control levers for any purpose except to correct direction. The wind was blowing at fifteen miles off shore, and was very 'bumpy' in spots, especially as we flew over the land. In spite of the side gusts to be felt from time to time in flying across the wind, the writer detected no heeling tendency whatever, even when the gust was to be felt very noticeably, nor could any tendency toward a side-slip be detected.

"In an earlier flight, solo, Mr. Webster stopped his motor dead at 800 ft. without turning down. The machine at once took its proper gliding angle, and the pilot had his hands off the levers from first to last until just ready to flatten out for alighting. Last week he made three complete and successive circles at an angle of approximately 75° with his control levers locked, and with his hands off most of the time. On the same day he tested for stalling, and pulled up both *ailerons* to their utmost extent, holding them there for more than a minute. Although the machine assumed an apparently impossible flying angle it refused to stall. Apparently the *aileron* area, sufficient to give control in ordinary flying positions, is overcome at such high angles by the high proportionate increase in the lift of the swept-back wing-tips.

"In all the Burgess-Dunne has made between thirty and forty flights, and without a sign of loss of balance. Some difficulty was experienced at first with the float, which was set at too high an angle, making landing very difficult. The Burgess-Dunne was found to fly at an angle of 4 degs., whereas Mr. Burgess had expected that the ordinary flying angle would be about 8 degs., which was the reason why the first adjustment of the float was incorrect.

"As constructed by Mr. Burgess, with float and all, the Dunne weighs, empty, 1,529 lbs. In a weight-carrying test it recently took up an additional load of 558 lbs., made up of pilot 176 lbs., passenger 197 lbs., ballast 34 lbs., water in radiator 40 lbs., gasoline 91 lbs., oils 20 lbs. The engine used was a Curtiss water-cooled 90-100, turning 1,312, and delivering a thrust of 640 pounds. Over a measured triangular course the Burgess-Dunne, with this load, made 58.5 miles, with a minimum of about 53 and a maximum of 64. With the power, which figures down to about 70 h.p. on its actual performance, and with a wing area of about 500 sq. ft., the speed wasn't bad."

"Eugene Montgolfier" Over Paris.

WITH ten persons on board, the Clement-Bayard airship, "Eugene Montgolfier," started from Issy at 7.30 a.m. on the 21st ult., and made a cruise which occupied an hour and a half, a good deal of which was taken up with manoeuvring above Paris.

Long Tests with the Schutte-Lanz.

ON the 21st ult. the new Schutte-Lanz airship "SL. II" started from her hangar at Cologne at 6 a.m., and after passing over Mannheim went along the valley of the Rhine to just by Karlsruhe. She then returned, and made a safe landing at Cologne, after being in the air about 5 hours. The same day another voyage was started at 11 p.m., and the airship cruised over the Black Forest for six hours through the night.

The following day some tests were made, and with sixteen persons on board, together with sufficient supplies for a voyage of ten hours she went up to a height of 2,100 metres, then came down to 70 metres in 8 mins., and regained a height of 2,000 metres in 9 mins.

On Tuesday, at 9 p.m., she left Mannheim and made a cruise of 20 hours' duration, passing Bremen at 3 a.m. on Wednesday, Hamburg at 5.30, Berlin at 9 a.m., and Jena 1 p.m.

Night Cruise by "Z I."

STARTING from Cologne at 2 a.m., on the 21st ult., the German military airship "Z I," escorted for part of the way by two monoplanes, made a four hour cruise along the valley of the Rhine, and then in the Ruhr valley to beyond Dusseldorf.

Balloon Voyage Across France.

By way of training for the Gordon-Bennett balloon race, Hugo Kaulen, accompanied by two friends left Barmen on Saturday evening, intending to voyage to Spain. Owing to contrary winds, however, they were blown across France and eventually dropped in the sea off Angoulins-sur-Mer, near Rochelle.



CORRESPONDENCE.

A Suggestion.

[1856] I thought I might make the following suggestion through the medium of your columns.

That, an interesting and appropriate item for the forthcoming Naval and Military Tournament would be the following:—An aeroplane (dismantled) should be brought into the arena in its packing-case on an R.F.C. motor-lorry, then erected, and if possible, the engine run for a minute or so, but as petrol would probably not be allowed in the arena, this part would have to be omitted, though a small electric motor would run the propeller for effect. Then the machine would be dismantled and put into its crate and removed on the motor-lorry.

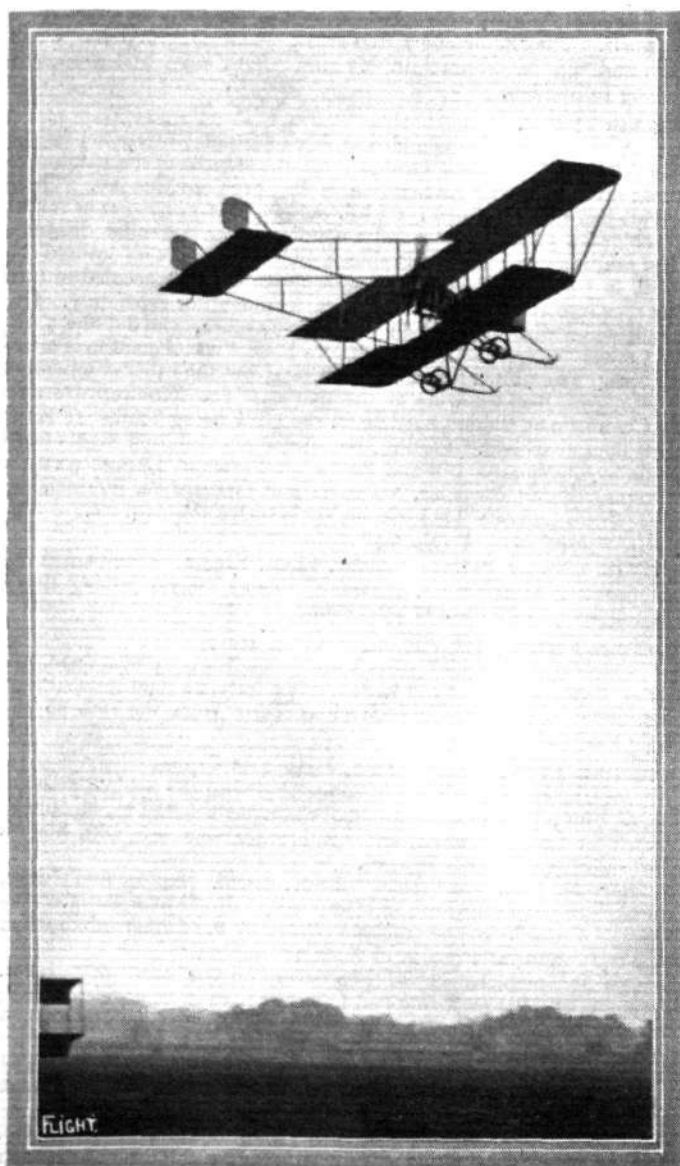
A little excitement might be added by having a party of Naval erectors to compete against a party of Army men.

I think this item would bring the subject of aviation before the public to a greater degree than has hitherto been the case.

I must apologise for the length of this letter, and I hope my suggestion may prove to be of some good.

Wimbledon.

H. C. NEWTON.



"Flight" Copyright

M. Verrier flying the Maurice Farman at Hendon.

Models

Edited by V. E. JOHNSON, M.A.

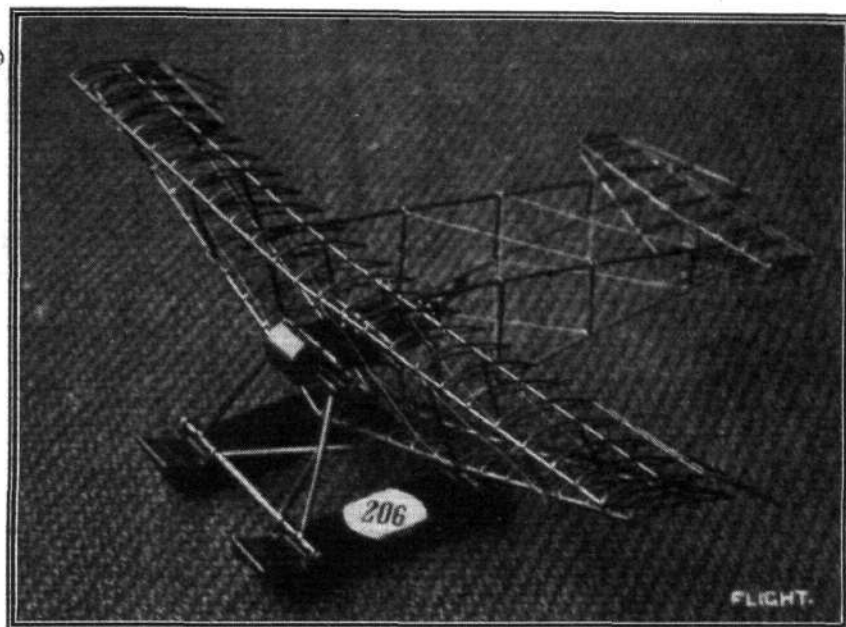
Aero Models at Olympia.

Mr. W. H. Nosworthy's Exhibits.

AMONGST the eight classes under which models could be exhibited at Olympia was one for models embodying new designs applicable to full-sized machines, a prize of £3 being awarded, at the discretion of the judges, for the model which embodied the most original and practicable ideas. This prize was awarded to one of Mr. Nosworthy's several exhibits, viz., No. 206, a model embodying several new ideas, and which is described in detail below. All Mr. Nosworthy's

working on a shaft which is rigidly connected to the fuselage. The two wheels to be operated by the aviator are movable only when desired, thus preventing accidents by slipping on the rudder bar, or falling over when holding the ordinary control, both of which we know have caused more than one fatal accident. The constant strain on the aviator is thus done away with, as the wheels may be set at any angle at will. The wings are connected to this control, and are movable, either together or separately, to increase or diminish the angle of incidence; this can be done as minutely as may be desired, or to the full extent of the rise and fall.

The rear portion of the machine consists of a stabilising tail, which, when moved in conjunction with the wings (this is done by the stabiliser being connected to the above control), provides for the turning movements and also assists in a slow descent. The propeller is driven from the centre of gravity through a gap in the wings, which gap, when alighting with the propeller stopped, acts similarly to a parachute. A pair of floating wheels give considerable support to a central float. These wheels are connected or released from the engine at will, and when connected are rotated in the water, thus giving

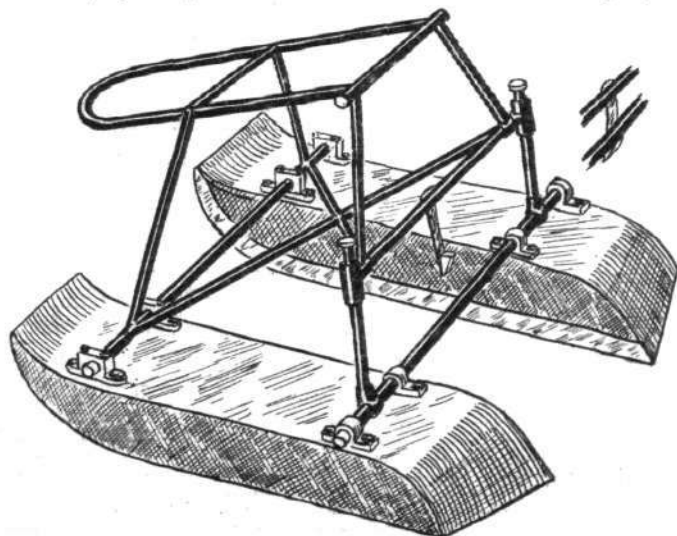


Mr. W. H. Nosworthy's dihedral biplane model, fitted with dihedral angled floats.

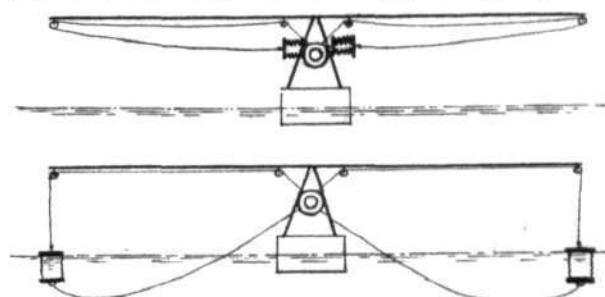
exhibits, which have been previously referred to in this section, were on sound practical lines, and there is no doubt his exhibits well deserved the reward they received; as to which was the best is, of course, a matter of individual opinion, but there can be no question as to the merits of his exhibits as a whole. With these few preliminary remarks, we pass on to consider them individually more in detail, taking first the particular exhibit for which the prize was more especially awarded.

Variable Angle Monoplane Amphibian.

In this model both wings are swivelled on the horizontal, and are moved by specially devised bevelled wheels and a worm gear, all



Showing how the angle of inclination of the floats can be altered at the will of the flyer on the Nosworthy model.

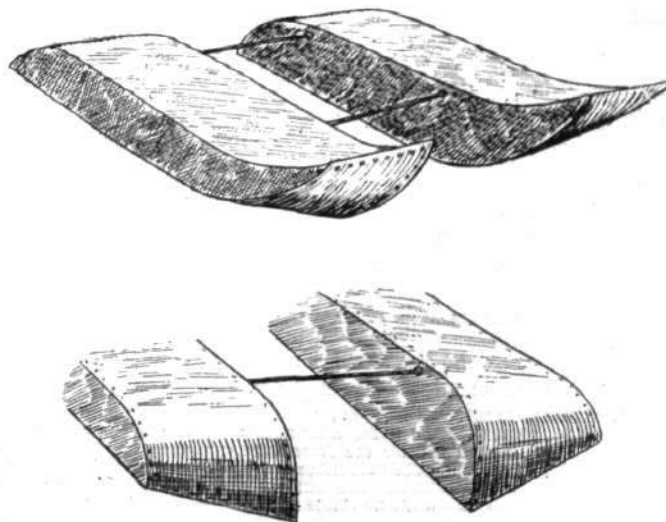


The collapsible anchor buckets on the Nosworthy model. At top, starting to run out, and below, in the water.

greater speed when rising. They are pneumatic tyred and sprung for alighting on land.

Referring to the above description, kindly supplied us by the inventor, the model exhibited was not a practical flying model, and if we understood Mr. Nosworthy correctly, he has not tested his ideas in actual practice; we refer more especially to the gap and propeller position and the floating wheels.

So far as we are aware, no flying model has been constructed with the gap and propeller position as here advocated. But the experiment is one well worth trying by a practical aeromodelist, and its effect on the longitudinal stability of the machine carefully noted. Should any reader care to try the experiment, and send us along the



The dihedral angled floats on the Nosworthy model.

results, we shall be pleased to publish them. With respect to the floating wheels, the writer has had some practical experience, and they are more hindrance than help. When left free to rotate they offer more resistance than when fixed. What happens if they are rotated by the engine at the same speed of travel as the machine over the water I do not know from personal experiments, but a "roller" boat constructed years ago and tried, if I remember correctly, on the Seine, was an absolute failure, as was only to be expected. The skin friction in such cases can become very high indeed, the water tending to follow the shape of the body and travelling round the rim. The same thing can be seen when holding bodies of varying shape under a steadily flowing tap.

The Dihedral Biplane.

This machine has been devised to give inherent lateral stability when flying. The top wing has a dihedral of some 2.75 degrees, and the lower one is set at an angle of about 22 degrees. When turning, one side of the lower plane is brought more into the horizontal position, giving greater support and preventing side slipping; whilst the other side prevents the machine from drifting. The tail planes are similar to the front, and when turning they present such surface to the air that the machine is equally balanced. Negative end tips are provided, and a rudder is dispensed with. This model is fitted with the new dihedral angle floats. Trials with a flying r.o.g. model have always shown an easy landing on the wheels, and the model has not met with a mishap of any kind.

Referring to this model, shown in the photograph, the dihedral principle there shown is not original, and has often been suggested to the writer, and tried by numerous aeromodellists. It was, as a matter of fact, originally tried by Mr. G. P. Bragg-Smith, but given up by him for his present well-known design, partly owing to the air-choking effect produced where the lower and upper planes meet. The dihedral angle principle has now very largely been given up by aeromodellists in favour of the upturned wing tips. No tail type model that the writer knows of can fly successfully without a vertical fin at the rear; it is, however, true that I have not seen the problem attempted with a dihedral angled tail.

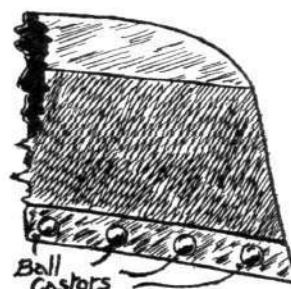
Dihedral Angled Floats.

These floats, the shape and construction of which are clearly shown in the drawings, are constructed with the idea of giving the minimum resistance to water travel, whilst the inventor claims that the suction lift is nearly one half that of the ordinary floats. Trials of

three floats (in pairs), one dihedral, one stepped, and one flat, of exactly the same length, width, and weight, were made on a course of 65 ft., with a movable weight on pulleys as motive power, the weight used was one of 6 lbs. The results showed that the dihedral shaped floats proved more than two-thirds faster than either of the other floats. Three tests were made with each set of floats, one test with a direct pull and the other two with a lifting pull. Ball castors are fitted to the floats to enable the machine to be easily moved in any direction, on shipboard, in hangars, &c. The rear portion of these floats can easily be dropped, so as to present an inclined angle to the waves when alighting and to take up the shock of concussion, also to prevent nose dipping and overturning. The above idea is undoubtedly in some respects a very good one, and one certainly worth well and thoroughly testing in full size as well as model form. What is wanted is a series of tests at different speeds with machines carrying their own motive power.

A Waterplane Stabilising Device or Surface Anchor.

This consists of two collapsible floating buckets, which are run out one to each end of the wing spars. They are immediately and simultaneously dropped into the water, and although they become filled they will not sink. Each bucket would contain about one hundredweight of water; this leverage on either side of the wings would act on the float or floats when rocking in rough water and so prevent the overturning of the hydro-aeroplane. The model shown at Olympia would not float upright with the buckets housed, but when run out to the water, it can be disturbed to any extent and the model will not capsize. The buckets can be quickly stowed inside the chassis or floats, and can (by special means) be instantly run out together. They weigh but little, and being housed inside the machine, they offer no such resistance as is offered by the usual side floats now in use. The emptying of the water is quickly done, whilst they are being wound in, simple valves and openings are provided for this purpose. They are, however, useless for steadying the machine whilst travelling over the water.



The ball castors fitted to the bottom of the floats on the Nosworthy model.

KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Single screw, hand-launched	Duration	D. Driver...	85 secs.
Twin screw, do. ...	Distance	R. Lucas ...	590 yards.
	Duration	G. Hayden ...	137 secs.
Single screw, rise off ground	Distance	W. E. Evans ...	290 yards.
	Duration	W. E. Evans ...	64 secs.
Twin screw, do. ...	Distance	L. H. Slatter ...	365 yards.
	Duration	J. E. Louch ...	2 mins. 49 secs
Single-tractor screw, hand-launched ...	Distance	C. C. Dutton ...	266 yards.
	Duration	J. E. Louch ...	91 secs.
Do., off-ground ...	Distance	C. C. Dutton ...	190 yards.
	Duration	J. E. Louch ...	94 secs.
Single screw hydro., off-water ...	Duration	L. H. Slatter ...	35 secs.
Single-tractor, do., do. ...	Duration	C. C. Dutton ...	29 secs.
Twin screw, do., do. ...	Duration	L. H. Slatter ...	60 secs.
Engine driven off grass ...	Duration	D. Stanger ...	51 secs.

Affiliation.—All clubs wishing to become affiliated should send in the applications at once in order that they may be printed in the official programme which is now being arranged, and also so that they shall be eligible to compete in the Inter-Club Competition for the Farrow Shield.

Official Observers.—All club secretaries should send in the names of gentlemen nominated by their committees for official observers for year, and also suggest dates on which their grounds will be vacant for trials. All official observers' names will appear in programme, and they will from time to time be called upon to assist in competitions.

Engine Bench Tests.—The last of the tests or competitions in connection with the Aero Exhibition took place at the East London College, Mile End Road, E., under Dr. A. P. Thurston, D.Sc., and Professor Morris. Full details will be published later.

27, Victory Road, Wimbledon.

W. H. AKEHURST, Hon. Sec.

AFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Bristol and West of England Aero Club (Model Section)
(42, ROYAL ORK CRESCENT, CLIFTON, BRISTOL).

Monthly Report.—Model flying meetings at the Sea Walls were recommenced on April 4th, and will for the present be continued every Saturday at 3.30 p.m. Mr. R. M. Haines has kindly presented first and second prizes for a single-plane competition, and this event will be contested at the weekly meetings. Excellent flights have been made by single and twin-screw models of the canard and tractor types. A distinct improvement in design has been noticeable in the models which have been constructed recently. They have been larger and of

larger proportionate span and some effort has been made to make the construction of even the duration machines less elementary and more detailed. The annual general meeting of the model section was held in the clubroom on April 7th, when Mr. P. A. Thompson, the hon. secretary of the Aero Club, took the chair. The chairman remarked on the energy which had been shown by the model section during the year and on the various ways in which this energy had been displayed, viz., in meetings, competitions, gliding, &c. The secretary's report and the balance-sheet were adopted. Mr. R. V. Tivy was re-elected hon. secretary and Mr. N. Gordon Stephens was elected asst. hon. secretary. Messrs. R. T. Howse and W. A. Smallcombe were re-elected and Mr. J. B. Allen was elected to the committee. Messrs. T. W. Egerton, P. A. Thompson and, *ex officio*, the secretary and asst. secretary of the model section were elected official observers (subject to the confirmation of the K.M.A.A.). The secretary reviewed the progress of the year with relation to the carrying out of the objects of the model section and made various suggestions for the furtherance of these objects. The subject of competitions was discussed and a number of events were suggested for the consideration of the committee. The chairman said that he would be pleased to give a prize for a competition to be held on the lines proposed by the secretary, the details to be settled by the committee. A vote of thanks for his valuable services was accorded to Mr. R. M. Haines, who was unfortunately unable to stand for re-election as asst. hon. secretary. The meeting concluded with a hearty vote of thanks to the chairman. April 8th, 10th and 11th, members attended Mr. B. C. Hucks's demonstration of looping the loop and flying upside down at Horfield, a special enclosure being reserved for the Aero Club. April 25th, members competed by invitation of the Bath and Somerset Aero Club in their spring competition at Lansdown racecourse, and were awarded the following prizes:—R.f.g. duration contest: First prize, R. T. Howse, 66 secs. H.l. distance contest: First prize, W. A. Smallcombe, 1,280 feet. H.l. duration contest: Second prize, R. T. Howse, 70 secs. Mr. N. Gordon Stephens unfortunately smashed a very promising-looking model in the first event. The arrangements made by the Bath and Somerset Aero Club in connection with the competition were in every way excellent. The visitors were conveyed to Lansdown in a private bus and a good tea was provided at the racecourse. Bristol was reached late in the evening after a very enjoyable day.

Croydon and District Ae.C. (82, CLARENDON ROAD, CROYDON).

MEMBERS are hereby notified that the competition for the Cup presented by Messrs. Hart and Finnigan, will take place at Mitcham on May 3rd, at 3.30 p.m. sharp. This competition promises to be a great success, as every member has entered.

Monthly Report.—In view of the excellent weather experienced during April, a great deal of valuable work has been done with all types of models. Messrs. Carter, Pavely, H. Smither and Hart have been out with their show models. Mr. Carter's monocoque tractor biplane has made some nice flights but requires further adjustment. Mr. Pavely has obtained some splendid flights with his tractor monoplane with which he secured third place in the Aero Show competitions at Hendon. One of the star performances of the month has been the consistent flying of Mr. Harold Smither's hydro. mono. He has repeatedly obtained durations of between 40 and 50 secs., the model terminating its flights with fine glides. Mr. Hart's floating-tail mono. (13½ ozs.) was too heavy for any great duration, but it has made some good flights from the ground, the well-sprung double-skid landing chassis enabling it to make very realistic landings.

Great credit is due to Mr. W. Taylor, who though practically a beginner, has had some fine flights with a geared motor tractor mono. of his own design. His best duration to date 40 secs. Messrs. Bell, Mullins, Carter and Hart have been out with r.o.g. monos. with good results. Mr. Mullins has had some of the finest flights yet seen at Mitcham his model being very stable and finishing its flights with fine glides with propellers stationary. Mr. Bell has had very big durations off ground—his best flight officially timed so far is 78 secs. Mr. Carter with a new model has been fitting about the Common, his model showing a decided tendency to go across country. Mr. Pavely has also obtained big distance and duration flights with an r.o.g. mono. Mr. C. Smith, with his well-made A-frame models has been giving exhibitions at Mitcham, Duppas Hill, Carshalton, Purley, &c., during the month. Mr. Bell has had some successful flights with a model fitted with a compressed-air motor. It is with the greatest pleasure the secretary reports that Mr. Jannaway, the well-known model maker, has visited the club on several occasions, and with his show machines has had some excellent flights.

Leytonstone and District Aero Club (64, LEYSPRING ROAD).

Monthly Report.—During the month hard work has been done by all club members' Section A in particular. Eight meetings were held during holidays, April 10th, although rather windy several models were out 1-1-P2 being in evidence; after practice W. Hersom, Ludow, Bedford and Bond adjourned to club-room and had bench tests with Hersom's two-cylinder compressed air engine. Although speed on engine was not quick enough, a great amount of knowledge was gained from it. April 11th proved to be too windy for models, Ludow's Olympia 'bus coming to grief on tuning up. Others out were Wood, A. Wharmsby, W. Hersom, Bedford and Bond. April 12th, some good durations were obtained, and W. Hersom some good altitudes with his 9½ oz. hydro. Others were Ludow (1-1-P2), Bedford (1-1-P2), McCulloch k (hydro.) h.l., Gratton (double surface 12-oz. tractor), Bond (1-1-P2 Olympia model) he obtaining 60 and 89 secs., F. and C. Hawthorn (Canard types r.o.g.), A. Wharmsby, a new member (h.l. 1-1-P2) obtained durations 40, 42, 45, and Towers, Piggott, Wood, Bedford, Boyd and Pitt also out. April 13th, W. Hersom, h.l. 65, 85, r.o.g. 77, 60. Bond 4-oz. tractor, best durations 48, 51, 53, C. S. Hersom r.o.g. 78, 83, 90 and 77, Wharmsby canard h.l. 45, 35 and 44, Ludow r.o.g., Piggott h.l., McCulloch h.l., 55 and 50, Bedford and Gratton with 1-1-P2 on altitude. April 19th, W. Hersom hydro. and r.o.g. obtained 73 secs. Sweepstake was held near Sand hills for duration r.o.g., H. G. Bond winning with 50, 67, 118 average, 76½ secs., second, S. C. Hersom 54, 60, 83, average 65½ secs., third, F. Hawthorn, 62, 63, 60, average 62. The half-yearly general meeting was held on 23rd inst. at club-room, and after election of officers a discussion on Farrow Shield and season competitions was held. April 26th, further good work in good weather. Mr. Louch flying his old record machine made a flight of 5 mins. 5 secs. out of sight; several members explored the district but could not see any sign of model. The distance estimated for this particular flight was ½ of a mile.

N.E. London Model Ae.C. (47, JENNER RD. STOKE NEWINGTON, N.)

Monthly Report.—Competition programme for the year was commenced by a successful, unrestricted distance competition on April 25th, the first prize, won by W. A. Dore with 609½ yds., duration 93 secs., a club record; W. Greffett, second. F. Burton flying single and twin "canards," also a 5 ft. span tractor. S. Lewin, with geared "canard" single-screw obtained 58 secs.; Longstaffe making tractor experiments, also 15-oz. hydro. on River Lea. Competition programme will be forwarded on request to all interested. May competitions are as follows: 9th, single screw r.o.g. duration; 23rd, tractor screw r.o.g. duration, no weight limitations. Prizes will take the form of silver trophies. Entrance fee for non-members, 1s., subject to alteration by the committee meeting, to be held May 2nd. Committee meetings are held after the flying, the first Saturday in each month.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

MAY 2ND, flying at Sudbury for silver and bronze medals.
Monthly Report.—On April 11th the competition for 6-oz. twin-screw models, average of three flights, was won by D. Driver, whose performances were very consistent with an average of 66½ secs. W. Evans was second with 64½ secs. average, and H. Woolley third with 47½ secs. Prizes were 3s., 2s., 1s. R. Bird was close up fourth with 47½ secs. J. Barrett fifth, 43 secs. On Easter Monday, April 13th, the single-screw competition, average of three flights, was won by M. Levy, 50 secs., D. Driver, 43½ secs., second; H. Woolley was third. Prizes 2s. and 1s. The twin-screw handicap on the same day was won by R. Bird, 71 points, F. Johnson was second with 61 points, and T. Carter third with 59 points. Prizes 2s. 6d., 1s. 6d., and 1s. H. Woolley was fourth with 55 points, and J. Barrett, 52 points, fifth. Mr. C. C. Dutton had several good flights with a light twin-screw model, his best times being 70, 80, 82, and 86 secs. The twin-screw handicap arranged for April 18th, was postponed until April 25th on account of the east wind, which owing to the nature of the surrounding ground causes gusty down currents, making it impossible to get good flights with models of the pusher type. It was found, however, that tractor models were not adversely affected to the same extent, T. Carter's machine making some really good flights. On April 25th the east wind again prevailed but was not so strong, but sufficiently so to make the durations rather poor. However, F. Johnson won the handicap comfortably with an average of 50½ secs. and scoring 70 points, H. Woolley was second with 63 points, and J. Barrett third, 50 points, W. Evans 44 points, fourth, R. Bird 35 points, fifth, and T. Carter 30 points, sixth. The latter was again having good flights with his tractor. The handicap prizes were 2s. 6d., 1s. 6d., and pocket knife presented by M. Levy.

Reigate, Redhill and District (THE COTTAGE, WOODLANDS AVENUE, REDHILL).

Rawson Cup Competition arranged for June 6th, twin r.o.g.s., minimum weight 6 ozs., minimum loading 4 ozs. to 1 sq. ft., average of three trials to be taken. Winner to hold cup, also be presented with silver medal (gold centre), second silver medal, entrance fee 9d.

Monthly Report.—There has been a good deal of flying during the month. Members did well in tuning up for Olympia trials but the club was very unfortunate, as most members were unable to get away to attend; nevertheless, 4 members turned up with the club's models, on the whole they did not do what the club was entitled to expect of them owing to there being soaked fuselages carrying more water than the wooden models, but it is some consolation to find that the club did so well for "design and construction." Several hot models are already under way for the next Rawson Cup Competition. During the "pre-Olympia" tuning up Mr. Sutton did a flight of about 40 secs. with his h.p. tractor and 45 to 50 with r.o.g. Mr. Key 32 with tractor and 43 with floating tail r.o.g. Mr. Morton good flights with Etlich, which were not timed. Messrs. R. G. and M. H. Wilson 45 and over with their floating tail r.o.g.s. Messrs. Hoyle, Hooton, Funnell and Greenhead were all showing promise. On Good Friday a competition had been arranged but postponed owing to very high and gusty winds; anyway 17 machines turned out and some good wind flying was done, Mr. Sutton getting very high flights with his F.T. h.l. Mr. Hoyle 35 secs. with

h.l. and 347 yds. 45 secs. with his Olympia r.o.g., this seems to be quite a good thing. Mr. Morton looping 4th h.l. mono. also fast and high flights with same. Messrs. Funnell and Greenhead were flying Olympia r.o.g.s. In evening Mr. Key's Olympia tractor was going Ar, a pleasure to watch; during Easter most members were out, since then Mr. R. G. and S. G. Wilson have been out with a 6 oz. r.o.g. floating tail. They have also been doing so with Olympia r.o.g.s., Mr. R. G. making trials with floats on water. Mr. Hoyle has been doing fine flying with his Olympia r.o.g. and a new 6½ oz. r.o.g., which promises to be good. Mr. Norton has altered Olympia r.o.g. and lengthened same, now undergoing tests, have had 40 secs. so far. Mr. Hooton has also been out with 3-oz. h.l., which is still "daring" on the top of a high tree. On 21st Mr. Norton had his Etlich tractor flying to perfection, getting 173 yds. and 32 secs. Mr. Sutton has been tuning a J.W.B. tractor slightly altered, a dihedral having been given it is certainly much more reliable than when in the hands of its previous master. Mr. R. G. Wilson has been declared the winner of Messrs. Bonn's prize. Messrs. Greenhead, Kennard and Young have also been out. Mr. Kennard, a new member, has built a floating tail machine which does him credit. On Saturday, 25th, Messrs. Sutton and Hoyle were flying Olympia machine, Mr. Sutton getting 50 secs. and Mr. Hoyle over 60, a very fine and high flight.

Sheffield Ae.C. (41, CONISTON ROAD, ABBEYDALE, SHEFFIELD).

MAY 2ND, Colver Cup contest for r.o.g. machines at Standhouse Aerodrome, Intake, 3.15 p.m. (weather permitting).

Monthly Report.—April 4th, competition for duration h.l. machines. Mr. Harold Blackburn acted as judge between intervals in his flights. Prize (British Empire Universities Dictionary, given by the *Sheffield Independent*) for longest flight won by Mr. W. H. Bagshaw with 110 secs. Mr. E. W. Colver, the president, and Mr. C. F. W. Cudworth acted as timekeepers. The machines had great difficulty in combating with the cross and down air currents. Each member was allowed three trial flights, Mr. Bagshaw doing in his first 1 min. 15 secs.; C. Dewsnap, on his second, 1 min. 5 secs. The youngest member of the club, Master C. E. Worrall, about ten years of age, did 52 secs. This being the close of the *Sheffield Independent* Aviation Week at Owlerton there were about 80,000 people who witnessed the flights in addition to those "outside." Mr. Blackburn was greatly interested in construction part of the models also highly delighted with the satisfactory way the proceedings had taken place.

Stony Stratford and District Kite and Model Ae.C. (OLD STRATFORD).

STONY STRATFORD.—May 6th, meeting at Wolverton; subject, "The Ding Sayers Model." May 20th, building evening. May 16th, May competition. Buckingham.—For times and days of meetings see branch secretary. Will all members please note that owing to the wretched support our last open competition received, it was unanimously decided not to hold any open competitions this season.

Monthly Report.—Stony Stratford.—April 1st, meeting at Wolverton; subject, Mr. Handley Page's address to the K. and M.A.A., and an excellent discussion followed. Mr. Lawson has kindly presented a machine for a novice's competition. Major Hooker, of Buckingham, has accepted a vice-presidency. The chairman has produced a "looper," as also the secretary, who has made a total number of 20 loops as a start. April 4th, March competitions at Old Stratford and looping. Results: Mr. Brown, 1st, average 23 secs.; Mr. Williams, 2nd, 20½ secs.; Mr. Brown, 3rd, 20 secs. Mr. Brown had a shot at the record in Classes 1A and 1B, and the following figures are the result: Class 1A, 409 yds. 1 ft.; 1B, 62 secs., and also opened Class 2B with 17 secs. with a single-screw. April 16th, lantern lecture. April 18th, April competition at Buckingham, very gusty and rough. Results: Mr. W. Palmer, 1st, average of 26½ secs.; Mr. Brown, 2nd, 23½ secs.; Mr. Williams, 3rd, 22 secs. April 21st, at Flitwick, Mr. Matson successfully raised the figures in Classes 4A and 4B with his twin r.o.g. to 117 yds. and 43 secs. Buckingham Branch.—April 8th, members meeting, discussion on duration. Mr. Palmer during the Easter Holidays successfully obtained a flight of 277 yds. and 40 secs., the best figures as yet put up by a branch member. April 11th, Branch competition: Mr. Cherry, 1st; Mr. Sturges, 2nd; W. Palmer, 3rd.

Wimbleton and District (165, HOLLAND ROAD, W.).

FLYING as usual May 2nd and 3rd.

Monthly Report.—April 3rd and 4th members were flying in Olympia trials at Hendon. In Class 2B, Mr. Boniface took 2nd place, his tailed machine showing great stability. In Class 6, Mr. D. Easdale's 30-oz. tractor took 1st place, the stability being excellent, while Mr. L. Slater and A. Houlberg, flying canard type machines, took 2nd and 3rd place respectively. Mr. Houlberg made one very fine flight of 67 secs. duration, constituting a record for this class of machine. In Class 2A, Mr. G. Hayden and A. F. Houlberg tied for 1st place, Mr. F. Powell coming 3rd, and Mr. Slater 5th. In this class the Wimbleton Team, consisting of Messrs. Hayden, Houlberg, Powell, Slater, Laing, and Chown, took 1st place, with a total of 1,095 mark. In Class 5, Mr. D. Laing took 2nd place. In the hydro trials at Welsh Harp, Mr. Slater took 1st place. Good Friday there was a very strong wind, but Mr. Whitworth, flying his Olympia hydro with the floats removed, obtained a fine flight of 145 secs., but unfortunately the machine passed out of sight over trees, and up to the present has not been recovered. On the Saturday and Sunday following the fine weather brought out a great many machines. Mr. Easdale's tractor was flying very steadily at a great height, doing 80 secs. Mr. Powell's 0-1-1-0-P2 machine was also flying very high, finishing all flights with a splendid glide. Mr. Hayden had out his Olympia machine, intending to make an attack on the duration record, but could not get more than 110 secs. On Easter Monday a sealed handicap for r.o.g. machines of all classes was held, the results being as follows:—1st Mr. Slater, twin-screw canard (start 47) 140; 2nd, Mr. A. F. Houlberg, twin-screw canard (start 37), 138; 3rd, Mr. D. Easdale, single tractor (start 52), 134. Mr. Boniface, single-screw pusher, tail type (start 77); Mr. D. Laing, twin-screw canard (start 73); and Mr. F. Powell, twin-screw tail type, start (36), all tied for 4th place with 132. Mr. Hayden (scratch) made a flight of 95 secs. out of sight. 15s. cash was distributed amongst the first three. Mr. Laing with his new tractor has got 74 secs. Mr. Slater (Olympia single-screw canard) on April 12th broke all records for duration with a flight of 3 mins. 50 secs., the machine passing out of sight over the trees in the direction of Southfields. It has not been recovered. Several heavy machines have been flying lately, including Messrs. Slater's and Easdale's Olympia weight-lifters. The latter, without weights, has been flying very high, doing durations of 45 secs. Mr. Easdale, however, was unlucky enough to smash his spar owing to a bad landing after a good flight. Mr. Tucker's big "Martinsyde" monoplane was flying very well, having been tuned up to flying at 60 ft. for 30 secs., when an unfortunate collision with a motor put an end to its activities, the spar being smashed in the middle. Mr. Boniface has been flying his Olympia single-pusher getting it tuned up, and on the 19th he excelled all his previous efforts with a flight of 100 secs. at a height of over 80 ft.

Windsor Model and Gliding Club (10, ALMA ROAD).

Monthly Report.—The models used last month were of a very varied nature. The public generally have evinced great interest, a fact which augurs well for the coming season. The following members have taken part in the flying:—Messrs. L. Spicer, F. Camm, E. Stanbrook, S. Dandridge, S. Camm, J. E. Starnes, while Master O. Allen has made a large number of flights at Datchet. At the trials at Hendon three members flew, Messrs. E. A. Dowsett, E. Stanbrook and S. Dandridge, who flew the secretary's model. E. Stanbrook had the misfortune to wreck his model before the start of the competition, and so did not compete. E. A. Dowsett made an average of 53 secs. in Class 2a, and S. Camm one of 25 secs. in the tractor class, coming in sixth. Messrs. W. Rogers would have entered, but unfortunately his model was carried away by an express during tuning up and has not been heard of since. Mr. J. Rogers is tuning up his enormous Olympia biplane with the idea of creating records later, it being about the biggest rubber-driven model in England, if not the world. The plans for the full-size machine remain in abeyance, but it is practically certain that work will be begun within two weeks. Opinion seems divided as to the merits of the tractor and propeller machines, but the fact that in a propeller machine the engine being behind makes a bad landing more dangerous has led to the majority being in favour of the tractor type. It is certain that in a tractor machine one may emerge from accidents unscathed, which in a propeller machine might easily end fatally. It is doubtful whether there is any great difference in the efficiency of the two systems; at any rate the tractor type lends itself to a cleaner design. Local enthusiasts are urged to join, as the membership is not up to full strength.

UNAFFILIATED CLUBS.

Bath and Somerset Aero Club (199, WELLSWAY, BATH).

Monthly Report.—A very successful model competition was held on the Racecourse at Lansdown on Saturday last, the programme attracting 14 entries. Event 1, r.o.g. duration, was won by Mr. R. T. Howse with a very fine flight of 66 secs.; Mr. R. C. Cross being second with 39 secs. Event 2, speed, was won by Mr. C. Brampton's twin-screw, the 100 yds. being covered in 6½ secs.; Mr. C. Jennings took second place, his time being 7 secs. The large number of spectators were greatly interested in this miniature Gordon-Bennett race. Event 3, distance h.l., fell to Mr. W. A. Smallcombe with a flight of 1,280 ft., Mr. Jennings being second with 1,220 ft. Event 4, h.l. duration, was won by Mr. R. C. Cross with a flight of 85 secs. (club record), Mr. R. T. Howse being second with 70½ secs. The special prizes for members of this club were won by Mr. R. C. Cross and Mr. C. Jennings for duration and distance respectively. The club hopes to organise some more competitions at a later date.

Dundee Aero Club (4, FORESTER STREET).

MAY 7TH usual monthly meeting, Clubrooms, Y.M.C.A. Buildings, 8 p.m. May 16th, competition for members not having won a prize in club competitions. H.L. any type. Tractors to have a handicap, to be decided later. May 30th, next competition for Luis Trophy. Members unable to be present on April 25th to compete for Luis Trophy, can do so before May 9th.

Monthly Report.—The Club has been in a bit of a difficulty this month owing to the public parks being closed to us, matters are now arranged and full use of all the parks is allowed except one. April 4th, Messrs. Robertson and Powrie exhibition flights in Locher Park. April 23rd, a meeting in the clubroom, Mr. Robertson presided. Draft of rules, &c., re Affiliation Scheme of Scottish Aeronautical Society, Model Aero Club were read and discussed, and seeing that it will help forward the Model Aero Club movement in Scotland the meeting decided to affiliate. April 25th, and competition for Luis Trophy r.o.g. Locher Park, declared off, owing to most of the members being unable to compete. Messrs. Stuart, Hall, Robertson, Maxwell and Powrie, however, visited the park to save disappointing the people who knew of the competition. Hall and Stuart's best average was about 40 secs.

Edinburgh Ae.S. (Model Section) (41, DRUMSHEUGH GARDENS).

Monthly Report.—The first annual report, presented at the first annual general meeting, on April 15th, after detailing the work done during the year, states that during the year 22 ordinary members joined the society. A glider is being constructed by members and will be available during the summer for gliding. It is an interesting fact that ten at least of the society's members have had practical experience either in building or in flying aeroplanes. The accounts show a small balance to be carried forward; the expenditure of the society covering fifteen months for only one year's income. The committee wish to thank all those who, by giving prizes for the model section or books to the library, have helped on the work of the society.

Edinburgh Aero Club (13, HERMAND TERRACE, EDINBURGH).

As most of the members have or are making hydros, a hydro meeting has been arranged for May 9th, at Inverleith Pond.

Monthly Report.—April 4th, Messrs. Watt, Hubbard, Clark, Fiddes, Hogg, Calder, Ross, Nesbitt and Ramsay at Inverleith Park. Messrs. Calder and Fiddes out with their first hydros. Saidler, r.o.g. twin-tractor mono., Clark and Ramsay A-frame models. April 9th, at night flying meeting at the Meadows, good flights were made by Messrs. Hogg and Nesbitt. 11th, meeting at the King's Park, St. Leonard's Gate, with good attendance of members. Messrs. Hubbard, Watt, Nesbitt, Fiddes and Ramsay all with A-frame models. The latter broke Mr. Hubbard's club record with a flight of 22½ secs. 16th, another night flying meeting in Meadows. Mr. Harrison, the president, made a welcome reappearance (he having been at Hendon for six weeks) with a large-span A-frame mono. and got some very fine high flights. Mr. Ramsay succeeded in again breaking the club record with a flight of 25½ secs. 18th, meeting was at Inverleith. Mr. Fiddes lost his hydro, which came to rest well out in the pond. In the higher part of the park before a large attendance the rest of the members gave a very fine display of h.l. models, and there was keen competition for the record. Mr. Ramsay raised his record to 30 secs., as also did Mr. Saidler. The former afterwards got a flight of 38 secs. Mr. Clark was out with a new model which flew quite well. Mr. Watt had a very promising machine, which unfortunately was broken early in the afternoon. Mr. Geddes, a new member, was also flying well. Mr. Harrison's machine showed remarkable stability and late in the afternoon broke all club records by a flight of 50 secs., including a glide of nearly 20 secs. Mr. Saidler was also flying a very small r.o.g. tractor mono. 25th, meeting at the King's Park. Messrs. Watt, Clark, Nesbitt and Ramsay out with A-frame models, Mr. Hubbard with a T-frame and Mr. Fiddes with an original bow-frame; although there were some good flights nothing was done in the way of records.

Finsbury Park and District (32, ASHLEY RD., CROUCH HILL, N.)

Flying May 2nd, Finsbury Park, from 3 p.m., r.o.g. duration contest 4 p.m. Secretary's change of address to 32, Ashley Road, Crouch Hill, N.

Monthly Report.—During month good flying by Mr. R. Mullin (Blériot mono.), B. H. Barnard (Blackburn mono. and 4-bladed screw Blériot), S. Gibbs (Deperdussin), H. Mullin (Blériot), A. Richards (Handley Page and Nieuport monos.), all tractors, Mr. S. Gibbs (tractor Deperdussin), S. Pratt (Blériot type with upturned tips), F. Steer (tractor biplane, Farman type), R. Barnard (Deperdussin with "B.E." adjustable tail), S. Pratt (Blériot), A. Richards (Antoinette mono.).

Ilford Model Ae.C. (83, ENDSLEIGH GARDENS, ILFORD).

MAY 3RD, flying as usual, 9.30 a.m., Hainault Forest, Chigwell Row (weather permitting). There has been an alteration in the competition, No. 4 (senior section). The minimum length for tractors has been altered from 40 ins. to 36 ins. Preliminary trials take place on May 3rd for competition on May 10th. Members please note, machines should be tuned up on Sunday, May 3rd.

Liverpool Aero Research Club (62, CEDAR GROVE, LIVERPOOL).

MAY 2ND, Model Aero Exhibition, Y.M.C.A. Hall, Mount Pleasant, 11 a.m. till 10 p.m., admission 3d.

Monthly Report.—Although to a certain extent flying has been held back on account of work on exhibition machines, still good progress has been attained over the preceding month. Stanley Park, March 28th, saw B. Tear and T. W. Bennett first at ordinary flying and afterwards looping, the latter having two of his graceful kites, which drew considerable attention. G. H. Kilshaw with twin racer doing very steady flights. April 4th, at Stanley, T. W. Bennett, E. Kilshaw, W. Beale, B. Tear and G. H. Kilshaw keeping a good audience interested with 1-1-0-P2 machines, the fine banking and turns of Bennett and Tear's models being superb, it being extremely noticeable how readily the two machines climb during small circuits. Good Friday morning at Sefton Park, W. Beale with 1-1-0-P2, G. H. Kilshaw 1-1-0-P2 and his tractor, the spectators, however, made flights with the latter impossible, for on two occasions after getting to about a foot high, some over-anxious person brought her down by getting in her flight path, W. T. Bennett experiencing the same trouble at Stanley with his large r.o.g. Canard, heavy showers stopping proceedings. Afternoon at Stanley, Bennett, Tear, Beale and Kilshaw flying racing canards before a great crowd, looping by Tear and Bennett being an item much appreciated. April 11th, W. Beale's racer excelled itself, doing loops and sideslips in good style. Easter morning at Sefton, B. Tear 1-1-0-P2, E. Kilshaw 1-1-0-P1, W. Beale 1-1-0-P2, G. H. Kilshaw 1-1-0-P2 and r.o.g. canard 33 ins. span. This machine rising first time out, off ground anything from smooth. Heavy showers in the afternoon kept many members from turning up, W. T. Bennett nevertheless braving forth and amusing an appreciative crowd at Stanley, having two bird kites 8 ft. 6 ins. and 4 ft. 6 ins. hovering over Everton Football Ground during the match, about 1,000 ft. high, also flying 1-1-0-P2.

Scottish Ae.S. Model Ae.C. (5, DOUNE QUADRANT, GLASGOW).

MAY 2ND, Arthur Corbett Cup Competition, h.l. distance and duration, 9th, 16th, 23rd, 30th, h.l., r.o.g., tractors for records, Paisley Racecourse. Trains 1.45 and 3 p.m. Central. June 6th, Arthur Corbett Cup Competition, r.o.g. distance and duration.

Monthly Report.—April 18th, a sealed handicap for duration was held at Paisley Racecourse. The handicap was a plus one, the results being as follows:—1. Ian S. Ross, 47 secs. + (30); 2. T. Graham, 64 secs. (scratch); 3. Jas. C. Balden, 42½ secs. + (3). During a trial Mr. T. Graham had a splendid flight at a great altitude, being lost to sight by the observer at 95½ secs. The distance of this flight when measured came out at 3,049 ft. beating the present record of 2,006 ft. handsomely. Both duration and distance are official Scottish records, and also club ones, for twin-screw h.l. Mr. Jas. C. Balden's best in trial flights were 60½ and 67, with single-screw mono. April 25th at Paisley Racecourse, Mr. T. Graham was testing a single-screw r.o.g. off a very rough ashpavement, his best duration being 23 secs. and 31 secs., the latter being a new official Scottish record, also a club one. It should be noted that all club records for r.o.g. are done without the use of starting boards. Mr. Jas. C. Balden had out a model for looping, &c., which it did on several occasions "à la Hucks" and Mr. T. Graham also did three or four side loops. Mr. A. M. Muir had out a neat twin-screw mono. which made several good flights.

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